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ESSAYS, ABSTRACTS AND REVIEWS

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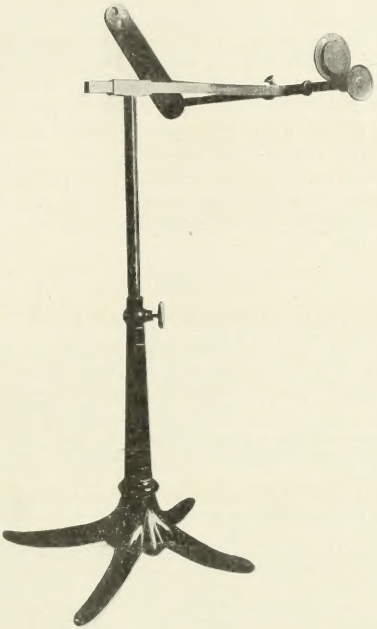

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Geo. L. Harlan

OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

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Original Articles

A STUDY OF HETEROPHORIA AND HETEROTROPIA IN DUCTION AND VERSION.*

EDWARD LAUDER, M. D., C. M.

Associate Professor of Ophthalmology, Medical Department Ohio Wesleyan University; Oculist St. Luke's Hospital, Cleveland City Hospital.

CLEVELAND, OHIO.

In the use of mechanical appliances for making an examination of the eyes we occasionally come across cases in which the deductions arrived at from the findings as determined by a certain appliance are not strictly in accord with those arrived at by other means. To a limited degree this applies in the examination of the extrinsic muscles as made by a tropometer and by prisms. To be more definite, the dynamic condition of the recti muscles estimated by the results of *version,* determined by a tropometer, does not always strictly corroborate the dynamic condition of the recti muscles estimated by the results of *duction,* determined by prisms. The tests of version and duction are very valuable aids in dealing with muscular disturbances of the eyes and it is well to use one to corroborate the other, when possible.

Duction can be used only in cases of binocular vision and, finally, has its greatest value narrowed down to cases of esophoria and exophoria. Version, on the contrary, is of value not only in esophoria and exophoria, but is our main reliance in cases of hyperphoria, determining which eye is the higher or which the lower, also in anaphoria, kataphoria and heterotropia.

As just stated, duction has its greatest value in cases of eso-

*Read at the annual meeting of The Academy of Ophthalmology and Otolaryngology, New York, October 6th, 1909.

phoria and exophoria, but I think I am safe in stating that there is no other appliance that can compare with a tropometer in aiding us to arrive at a satisfactory decision as to the modus operandi in the various conditions of heterophoria and the much abused condition—heterotropia or squint.

In the following few case reports I shall endeavor to illustrate the points I have raised as to the value of a tropometer, and also refer to the apparent lack of corroboration between the results of version and duction in some of the cases in estimating the dynamic condition of the internal and external recti. In the light of more mature experience some of the cases might have been dealt with differently as to the operative procedure, as I since have learned to depend more on version than on duction in esophoria and exophoria, whereas previously I depended too much on duction in those conditions, but I have no misgivings because the results, in relief obtained by my patients, justified the means.

The first series will deal with cases of exophoria; the second with cases of esophoria; the third with cases of hyperphoria, and the fourth with cases of heterotropia.

Series A. This series comprises three cases of exophoria representing different types. In No. 1 there is a refractive error with a *manifest* total exophoria of 2 deg., in which adduction is deficient. In No. 2 there is a refractive error with a *total* exophoria of 12 deg., composed of 2 deg. manifest and 10 deg. latent, in which adduction is good, but abduction is excessive. In No. 3 there is *no* refractive error, but a *total* exophoria of 12 deg., composed of 2 deg. manifest and 10 deg. latent, in which adduction is fair, but abduction is excessive.

Case 1. Miss W., aged 36, referred to me in April, 1906, complaining of temporal, vertical and occipital pain. My examination, under a mydriatic revealed a refractive error of simple hyperopic astigmatism in each eye, patient accepting + 1.50 cylinder, axis 90 deg. in the right eye and + 1.00 cylinder, axis 90 deg. in the left eye, and with this correction 20/xx could be read with either eye. The static muscular condition showed a total exophoria of 2 + deg., and the dynamic condition a duction of 5 deg. with each external rectus and 4 deg. with each internal rectus. Version showed an excursion of 50 deg. in and 50 [illegible] in each eye, 55 deg. and 50 deg. respectively being considered normal). In this case duction and version cor-

roborate each other, and indications clearly point to a shortening of the internal recti.

Incidentally, I may mention that some writers of text books advise that in prescribing for hyperopes with exophoria, we should avoid giving full correction, as the accommodative effort made to overcome the uncorrected portion stimulates convergence. The theory is sound from the standpoint of physiology, but otherwise must be condemned as it creates two wrongs in an effort to correct one, that is, it causes an effort of accommodation and of convergence in an attempt to overcome divergence. This patient already wore glasses and the prescriber had added — 0.25 spherical to each lens, which were plus cylinders, evidently to stimulate convergence.

Case 2. Miss A. W., age 24, referred to me in January, 1907, complained of a persistent severe frontal and occipital headache for two months. Her facial expression was one of agony. She was wearing glasses ordered by an optician, being a poor attempt to correct the existing refractive error. Refraction revealed a compound hyperopic astigmatism, right eye + 1.75 ⊂ + 0.25c ax. 90 deg., left eye + 1.25 ⊂ + 0.50 ax. 90 deg., correction of which did not give relief. The static muscular condition showed a *manifest* exophoria of 2 deg., and the dynamic condition a duction of 8 deg., with each external rectus and 20 deg. with each internal rectus. By the use of prisms a *latent* exophoria of 10 deg. was developed, making a *total* of 12 deg. Duction in the meantime increased to 20 deg. with each external rectus and remained at 20 deg. with each internal rectus. Version showed an excursion of 40 deg. inward, 46 deg. outward for the right eye, and 47 deg. inward, 42 deg. outward for the left eye. In this case duction and version did not corroborate exactly, but, rather, version showed a tendency to dextrophoria, a condition to which attention has been directed by Dr. Francis Valk (see Transactions of the Academy of Ophthalmology and Otolaryngology 1905, page 187). After observing the case three months I did a graduated tenotomy on each external rectus. Seven months later (Nov., '07) eyes showed exophoria of 2 deg. Duction of 8 deg. with each external rectus and 20 deg. with each internal rectus. By combining a 1 deg. prism, base in, for each eye, with her refractive correction, she is following an occupation requiring accommodative and convergent effort, is absolutely free from pain and has gained twenty pounds in weight. If I should

have another case giving similar results in version I would shorten the right internal rectus to supplement the operation on the external recti.

Case 3. Mrs. B., age 54, referred to me in December, 1906. Complained of severe headache, nausea and vomiting, necessitating one or two days in bed almost every week. The facial expression was one of pain and expectancy. She had six pair of glasses, some intended to correct a static refractive error, others the presbyopic condition. Refraction revealed emmetropia. Examination of the muscular equilibrium showed a *manifest* exophoria of 2 deg. +, with a duction of 6 deg. with each external rectus, and 15 deg. with each internal rectus. The case was followed for nearly three months, by which time a *latent* exophoria of 10 deg. had been revealed, making a *total* exophoria of 12 deg. Duction increased to 12 deg. with each external rectus and remained at 15 deg. with each internal rectus. Version showed an excursion of 45 deg. in and 45 deg. out for each eye. I did a graduated tenotomy on each external rectus. Seven months later (Oct., '07) eyes showed orthophoria. Duction of 6 deg. with each external rectus and 20 deg. with each internal rectus. While not relieved absolutely of her headaches, they are not nearly so frequent nor severe, the necessity of going to bed being avoided entirely, and the expectant and pained expression of countenance has disappeared.

Series B. This series comprises two cases of esophoria representing different types. The first has a high refractive error, a compound hyperopic astigmatism in each eye, with a total esophoria of 12 deg., in which abduction is normal but adduction is excessive. The second has a simple hyperopia in each eye, with a total esophoria of 21 deg., in which abduction is deficient and adduction is excessive.

Case 1. Mrs. G., age 19, referred to me in October, 1905. She was wearing glasses but complained of frontal headache and pain in eyes. Refraction revealed a high grade of compound hyperopic astigmatism, right eye + 3.00 $\bigcirc$ + 1.75c ax. 90 deg., left eye + 3.00 $\bigcirc$ + 1.25c ax. 70 deg. There was a manifest esophoria of 10 deg. I prescribed lenses for correction of the refractive error. With these she was comfortable for some months. In May, 1907, nineteen months after correcting refractive error, she returned, complaining of some discomfort about the eyes. Refraction was the same as previously, and a *manifest* esophoria of 8 deg. Abduction was 6 deg. and adduction 22 deg. By the use of prisms a *latent* eso-

phoria of 4 deg. was developed, making a *total* esophoria of 12 deg. Abduction remained at 6 deg. while adduction increased to 32 deg. With a tropometer there was *version* of 48 deg. inward, 50 deg. outward for the right eye, and 53 deg. inward, 44 deg. outward for the left eye, which again does not corroborate duction, but rather shows a dextrophoria. I did a graduated tenotomy of the left internal rectus on the 9th of July, '07. Two months later, 11th Sept., '07, the static condition showed an esophoria of 4 deg. and a duction of 6 deg. with each external rectus and 20 deg. with each internal rectus. The patient expressed herself as feeling much more comfortable and was relieved of a strained sensation when she wished to turn her eyes to the left. In another case similar to this, depending on version rather than duction, I would prefer to shorten the left external rectus.

Case 2. Miss S., age 16, referred to me December, 1906. Was wearing — 0.25 cylinder axis 180 deg. in each eye. Complained of headache and pain in eyes. Refraction revealed simple hyperopia of + 0.50 dipotre in the right eye and + 0.75 dioptre in the left eye. There was also present a *manifest* esophoria of 15 deg., and a duction of 6 deg. with each external rectus and 25 deg. with each internal rectus. The refractive error was prescribed for and ten days later patient reported decided improvement so far as personal comfort was concerned. In February, '07, two months after correction of refractive error, patient returned and complained of not being so comfortable. Taking up the muscular condition I found esophoria of 20 deg., and that duction showed 2 deg. for each external rectus, and 32 deg. for each internal rectus. I prescribed temporary prisms, 3 deg. base out for each eye, to be worn over the refractive correction. Two months later (April, '07) patient reported little improvement. Abduction 2 deg. each eye, adduction 35 deg. each eye. Version showed 45 deg. inward, 35 deg. outward for the right eye, and 50 deg. inward, 35 deg. outward for left eye. In this case both duction and version point to the necessity of giving more power to the external recti muscles, which I proposed doing by tucking the tendons. To this the parents objected and I dismissed the case.

Series C. This group comprises two cases of hyperphoria, one with a refractive error and the other with normal refraction. It is in this form of heterophoria where we more thoroughly appreciate the value of a tropometer, as duction is of

comparatively little value and it is practically impossible to locate the defective muscle or muscles by that test.

Case 1. O. F., age 12, referred to me in December, '07. Complained of headaches, nausea and vomiting to such an extent that attendance at school was seriously interfered with. Refraction revealed a simple hyperopia of + 1.25 dioptres in each eye. The static muscular condition showed right hyperphoria of 12 deg. *Version* showed an excursion of 33 deg. (normal) upward in the right eye, and 22 deg. upward in the left. The tropometer findings point absolutely to the defective condition of the superior rectus of the left eye. On 22nd Sept., '08, I shortened that muscle. The result of the operation was to reduce the hyperphoria to 2 deg. By combining a prism with his refractive correction he is perfectly comfortable and pursues his studies uninterruptedly.

Case 2. Miss T., age 33, referred to me in November, '07. Occupation, artist. Complained of sick headaches. Refraction normal. Static muscular condition shows a right hyperphoria of 4 deg. *Version* showed an excursion of 33 deg. upward in the right eye, and 30 deg. upward in the left eye. This patient is now wearing 1½ deg. prism, base down, in the right eye, and 1½ deg. prism, base up, in the left eye and is very comfortable. The tropometer in this case again locates the weak muscle as being the superior rectus of the left eye.

Series D. This group comprises four cases of heterotropia or squint. No. 1 is a case of high degree constant converging squint; No. 2 is a case of intermittent converging squint; Nos. 3 and 4 are cases of diverging squint.

To those who have never used a tropometer as an aid in solving the pathological condition present in this class of cases, there remains a revelation in store, as conditions will stand forth with a clearness which cannot be adduced by any other method with which I am conversant.

Case 1. V. B., age 13, referred to me in September, 1905. Convergence of left eye since two years old. Has simple hyperopia of + 1.25 dioptres in each eye, and with this correction vision was 20/20 with each eye. Could fix with either eye, but used the right eye constantly. I prescribed glasses to be worn constantly, with instructions to return occasionally for observation. In June, 1906, there being no improvement in the strabismic condition I advised operation. Version showed an excursion of 55 deg. inward, 50 deg. outward for the right eye, which is normal, and 75 deg. inward, 20 deg. outward

for the left eye. Measured by the perimeter the convergence was 32 deg. I put a tuck in the external rectus and tenotomized the internal rectus of the left eye. The result was perfect and has remained so.

Let me quote the method given for dealing with such a case from three different text books, printed since I began practice in 1897. First: "If the vision of the squinting eye be fairly good, and the power of the external rectus sufficient, and if the squint be more than 20 deg. it is advisable to divide the proceeding between the eyes—for example, if it be 30 deg., about 20 deg. are corrected by tenotomy of the internal rectus of the squinting eye, and the remainder by tenotomy of the internal rectus of the fixing eye." Second: "When operation is decided upon, it is a safe rule to divide only one internal rectus at a sitting. At the end of a few weeks, if the squint still be considerable, the operation is performed on the other eye." Third: "A simple tenotomy corrects a squint of about three or four millimeters. If the strabismic deflection is considerably greater than this amount, a second tenotomy must be performed in addition upon the other eye."

It was by following such advice in dealing with similar cases in my early years of practice that I was driven to despair, as the results obtained were not satisfactory. There is little doubt but that a normal internal rectus was sometimes tenotomized, while an abnormally weak external rectus muscle, which should have been shortened, was not touched. Bearing on the same question I shall quote from an editorial "The Surgical Treatment of Squint," appearing in *The Ophthalmic Record*, January, 1906, page 15, as follows: "Not so many years ago, and even at the present time, we were advised, in a case of squint, to perform tenotomy on one of the interni—generally that of the squinting eye—and if that did not produce parallelism, then tenotomy of the other eye, and so on ad infinitum until the optic axes became parallel, with or without binocular vision as might happen. Then if an overcorrection was produced we were told, 'Well, operate and put it back.' The next step in our surgical procedure was to first stretch both interni, on the supposition that this would paralyze the action of these muscles, and then to perform a complete tenotomy on the same muscles, followed by a binocular bandage. . . . Other operators, at the same time, tell us not to do the double tenotomy, but to advance both externi, whereby we increase the motility of the eyes and in many cases will correct the squint without a tenotomy. . . . But all these procedures, [illegible]

advanced by their exponents, *in no way advise nor suggest anything in reference to what may be any special anatomic features of the case.*"—(Italics by author.)

Case 2. Miss S., age 19, referred to me in June, 1907. She has attractive features and a pleasing personality. Her occupation brings her before the public in vaudeville and light opera. At times she was chagrined by the consciousness that her left eye was converging, and it was for this condition that she sought relief. Refraction revealed hyperopia of + 3.25 dioptres in each eye, with correction of which she had vision of 20/xx in the right eye, and 20/lx in the left eye. Binocular vision was absent. Could fix with either eye and, on casual observation, visual axes appeared parallel. *Version* showed an excursion of 55 deg. inward, 45 deg. outward in the right eye, and 55 deg. inward, 40 deg. outward in the left eye. By wearing glasses and thus relieving the accommodative effort, the patient was entirely free from the intermittent squint. In her vocation it was obviously impossible to do this. Two months after first observing the case I put a tuck in the tendon of the left external rectus. The operation has proven an entire success as the patient is not now annoyed as previously, and wears the glasses only for close work.

Case 3. A. R. F., age 41, first consulted me in August, 1904. Has + 0.50 dioptre hyperopia in each eye. Vision 20/40 in the right eye, 20/xx in the left eye. Right eye slightly divergent. He returned in April, 1906, and requested that the right eye be straightened. Version showed an excursion of 25 deg. inward, 60 deg. outward, for the right eye, and 50 deg. inward, 45 deg. outward for the left eye. In this case indications clearly pointed to giving the right internal rectus more power, which I did, by the tucking operation. Knowing the tendency for a diverging eye to return to the original position after an operation to correct the deformity, I took the precaution to do a guarded tenotomy of the external rectus at the same time that I shortened the internal, the intention being to weaken abduction while firm union was taking place in the internal. The result was perfect and has remained so.

Case 4. Miss M., age 25, consulted me in May, 1906. When a child the right eye was injured by a pin, producing a traumatic cataract, which was absorbed. The eye now diverges and has simply perception of light. The left eye has vision of 20/xx. Version showed an excursion of 40 deg. inward, 60 deg. outward, for the right eye, and 55 deg. inward, 50 deg. outward for the left eye. In this case I put a tuck in the right internal rectus

and did a guarded tenotomy of the external. The result was perfect and has remained so.

A favorite author states in his book that, "In correcting a divergent strabismus a single tenotomy is hardly ever sufficient for this purpose; we must at least perform a tenotomy in both eyes, and generally an advancement as well." Another states that, "Operative measures depend entirely upon the degree of the deviation, the vision in the diverging eye, and the cause of the difficulty. When true divergent strabismus exists, it is usually necessary to perform an operation to correct it. This may be either tenotomy of one or both externi, or this operation may be combined with advancement of the internal rectus."

Cases 3 and 4 clearly indicate that had a tenotomy been done on the external of the other, or non-squinting eye, we would have been interfering with a normal muscle, as in neither case did the external rectus show more than a normal dynamic condition.

It would be possible to cite many other cases, a study of which would augment the proof of the value of a tropometer in dealing with disturbances of the muscular balance of the eyes, but I will close with the statement that of all the appliances with which I am conversant, used in studying the disturbances of the muscular balance of the eyes, none has rendered me more service and satisfaction than a tropometer. In fact, I consider its use in dealing with disturbances of the muscular balance as of equal value to the use of atropine in refraction, and no oculist will gainsay the value of the latter.

1021 Prospect Ave., S. E.

DEMONSTRATION OF THE SIZE AND POSITION OF THE ANGLE ALPHA BY A SIMPLE MODIFICATION OF THE JAVAL-SCHIÖTZ OPHTHALMOMETER.*

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If a line is drawn through the center of the refracting media, that is, with the center of the cornea as one point, and the center of the lens as another point, this line we have agreed to call the optic axis.

Again, if a line is drawn from the macula lutea to the object at which the eye looks, this line we have also agreed to call the visual axis. In the normal eye the visual axis emerges somewhat to the inner side of the center of the cornea.

The angle enclosed between these two lines was called at first by all writers the angle alpha.

From the earliest time, students of physiological optics have been unanimous as to the names and positions of these two lines. We all agreed upon these statements just as much as we have agreed that the earth is a sphere. But if some one should insist that the earth is not a sphere, but is flat, naturally we ask ourselves what are the different well known proofs of our ordinary views on this subject.

In a similar way if any one should say to us that the visual axis and the optic axis coincide in emmetropia and in ametropia, naturally we ask ourselves what are the proofs of the usual conception of students of physiological optics concerning this point. My object is to present simply one set of these proofs of a very common form. These relate to the entoptic images.

For our present purpose it is sufficient to deal only with the reflection from the anterior surface of the cornea, and the one from the posterior surface of the lens. In order to see these, attention is called to a modification of the Javal-Schiötz ophthalmometer, which was described in my first volume on the

*Read at the meeting of the American Academy of Ophthalmology and Oto-Laryngology, New York, Oct. 5, 1909.

Muscles of the Eye, but has not before been demonstrated. It consists:

First: In simply removing the double refracting prisms from the tube of the instrument, thus converting it into a simple telescope.

Second. In placing a candle or small electric light directly above or below the tube. (See Figures 1 and 2.)

Third. In attaching to one of the mires a glass ball, at such a point that the ball is over the center of the tube, when the index of the wire marks a certain point on the arc, for example five degrees.

It is a very simple matter to measure this angle in any individual, especially if the pupil is dilated with cocaine or hematropin. Let us suppose for example that we wish to measure the angle alpha in the right eye of a patient. The most convenient method is to run a couple of turns of a roller bandage over the left eye. The person then sits before the table with his chin resting on his hands, or still better, with his teeth fixed on the "Helmholtz Bit" of an ophthalmologic head rest. The room is somewhat darkened, and the candle or electric light, which is in the same vertical plane as the axis of the telescope, is lighted.

As the observer looks through the telescope he sees the two reflections. The brighter and larger of these, is of course, from the anterior surface of the cornea, and that being a convex mirror, shows the flame of the candle or the electric light bright and distinct. The second reflection is from the posterior surface of the lens. This is only a small point. The reflection from the anterior surface is seen with some difficulty and only with a telescope which has a focal distance with which it is inconvenient to work. Therefore, for our present purpose that reflection is ignored.

When we ask the person under examination to look into the tube of the telescope, we see these two reflections as described. The large bright one from the cornea being above and to the right, the small one from the posterior surface of the lens being below and to the left. In other words they *are not* in the same vertical line, but their position shows, of course, that the lens of the right eye is then facing toward the right side of the person under examination. That is to say the optic axis of the eye does not correspond with the visual axis.

Next, let us see at what point the reflection from the cornea *is* in the same line with the reflection from the posterior surface of the lens. In order to do that we ask the person to turn his right eye slowly toward the left, and in order to ascertain to just what degree he does this, he is directed to look at the glass ball which is arranged to slide above the brass arc attached to the telescope, the curvature of this arc being such, of course, that the center of the arc corresponds to the center of the eye. If we move the glass ball or whatever is chosen as the fixation point over this arc, gradually from the vertical plane of the center of the telescope toward the left of the person under examination, then as the patient continues to look at the glass ball, the observer notices that the small reflection from the posterior surface of the lens gradually comes nearer to the same vertical line as the reflection from the cornea. If the person under examination is an emmetrope we can usually pass the ball over three, four, five or more degrees to the left. When the observer finds that the reflection from the posterior surface of the lens *is* in the same vertical line with the reflection from the anterior surface of the cornea, *then* the axis of the telescope corresponds with the optic axis of the eye under examination. A line drawn from the glass ball to the macula lutea represents, of course, the visual axis. The angle between the optic axis and the visual axis is according to our definition, the angle alpha. In this case, therefore, we read off on the arc, the size of this angle and we know positively that the anterior pole of the eye lies say five degrees to the temporal side of the visual axis. (Figure 3.)

This is not a question of theory, merely a well known fact. My excuses for presenting the subject is that the existence of the angle alpha has been denied by one of the speakers and also that it can be so easily shown by means of this modification of Javal-Schiötz ophthalmometer.

MIXED ASTIGMATISM WITH MERIDIANS OF ASTIGMATISM NOT CROSSING AT RIGHT ANGLES.

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NEW YORK.

It is probable that this is a fairly common condition, and, perhaps the same anomaly of angles occurs frequently also in cases of compound myopic and hyperopic astigmatism, but variations from the right angle are likely so slight as to be usually overlooked. By reason also of the same small variations, the customary lens—sphero-cylindric—in effect cross cylinders at right angles, with varying degrees of the same or different elements, gives quite satisfactory vision. The present consideration, however, relates particularly to mixed astigmatism.

Slight deviations from the right angle are probably best detected by using cylinders only, both in making the retinoscopic and trial case examination. An idea of the foci and positions of the cylinders having been obtained by the use of the retinoscope, the plus cylinder is first used in making the final examination with the test letters. This cylinder's axis and focus are verified or changed. The minus cylinder is now added and altered as to the focus and position as improvement of vision may indicate. Both cylinders (plus and minus) now in the trial frame at axes determined, variations are tried—and this step is well repeated when the two eyes are uncovered, as there may then be an improvement of vision when one or both axes are changed.

An illustrative case occurred in a German girl, nineteen years of age. Health excellent. Ophthalmoscopic and other examination of the eyes revealed no pathologic lesion, and macula of the cornea was especially searched for. No keratoconus. O. D. V. = 15/cc; O. S. V. = 15/lx. The correction for the right eye proved to be + 3.50 D. C. axis 90°, combined with — 3.00 D. C. axis 170°, V. = 15/xxx; for the left, + 1.50 D. C. axis 90°, V = 15/xv. With both eyes in use together the axis of O. S. was changed with advantage to 85°.

It is observed that the variation from the right angle in the present case is 10 degrees. I have seen this as much as 20 degrees and several times 5 degrees and less. Probably this anomalous astigmatism occurs more commonly in cases of mixed focus than in any other. Still, compound cases of the same quality, repeatedly dissatisfied with changes in the usual sphero-cylindric combinations, may be pleased with cross cylinders, however little these cylinders may fail of forming an exact right angle. Plain spheres, because they cause a uniform change of conditions, may, in these stubborn cases, be more readily accepted than sphero-cylinders, regardless of the vision obtained. Many omit the cylinder in a correction with expectation of comfort to the patient, because experience has frequently proved this to be a prudent step. Why, is not always easy to say, and this observation may explain some obscure cases.

A POCKET OPHTHALMOSCOPE.

J. Herbert Claiborne, M. D.,
NEW YORK.

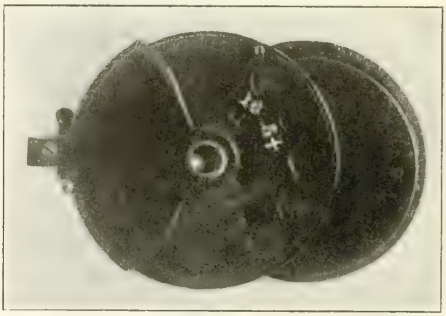
The accompanying cut represents a pocket ophthalmoscope which I have had constructed for convenience and rapidity in use.

It consists of a circular concave mirror with the quadrant

ratchet of Loring. The focal length is the usual one. The mirror is protected from being broken by a flap which folds

over it and is lined by felt. When folded the whole occupies the space taken up by a pocket watch. When opened it is about twice the length of its diameter, and a snap catch at the joint holds it firmly in this position. The cover fits easily and snugly in the palm of the hand when it is in use, and the instrument is handy in both the direct and indirect examination. It was attempted to attach the reversible mirror of Morton to it but it was found to be impracticable.

The instrument is best put into a soft buckskin case with button attachment and carried in the right waistcoat pocket. If the biconvex lens be carried in the left the ophthalmoscopist will find himself ready at all times to examine a patient criti-



calley and with dispatch. The box in which ophthalmoscopes are usually carried are anything but handy and it is a loss of time to have to screw on the handle to the mirror. Oculists nowadays generally carry their bifocal lenses in the right or left waistcoat pocket. The arrangement suggested above makes his equipment complete.

I understand that a description of an instrument similar to the above has been published in the West, but I have not been able to find the publication in which it appeared.

The instrument is made by Gall & Lembke, 1 W. 42d St., New York.

11 East 48th St.

A NEW SKIASCOPE.

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SEATTLE.

If one attempts to measure the refraction of the eye by skiascopy, or, as some call it, retinoscopy, three or more methods are open to him: Thorington's, with the plane mirror held

close to the source of light; Edward Jackson's method, which he terms exact skiascopy, also with the plane mirror, and the method which makes use of the concave mirror with the light

back of the patient. Some operators use the plane mirror at a meter's distance, with the light behind the patient.

Thorington's and Jackson's methods must be carried out in quite a dark room, so dark that when the examiner wishes to move about the patient he must turn on another light or risk treading on the patient's toes. If he makes a record of the case it is difficult to see; the number on the trial lenses are hard to make out; the heat from the lamp in summer is often so disagreeable as to make the examiner wish to cut short the examination.

These objections do not apply to the method of using the

concave mirror with source of light behind the patient but are perhaps more exact.

With all these methods it has been necessary to have the trial case in the dark room if the refraction was complicated. The examiner has had to clean the lenses or have it done for him, and if three or four skiascopic examinations were made in the same afternoon an hour or more would be spent in the dark room on this measurement alone.

Having in mind these objections and difficulties of skiascopy various writers have sought to devise mechanical means of saving time. Doyne (1887), Burnett (1888)) Würdemann

(1889-1891), Marple (1892), Skeel (1893), and others have used discs and hand skiascopes. The so-called Geneva retinoscope and the Meyrowitz double disc retinoscope have been objectionable because of the superimposed lenses in a tube which made the patient accommodate, and because of small lenses and of difficulty of adjustment of the double disc of Meyrowitz.

The writer has sought to overcome some of the objections by using the principle of Morton's ophthalmoscope rather than a disc. This allows of the use of a two centimeter or even of an inch lens and of rapidity of change of the lenses. The lenses being protected from dust and from fogging from the patient's breath, which is troublesome in the use of Skeel's, Würdemann's or Meyrowitz's devices, require to be wiped only once in a week or two, and then being of a size which admits of access to the lenses without taking the case apart, the cleaning process is quickly completed.

The writer's skiascope contains twenty-six lenses supplemented by a disc containing two more, and by a spring clip which will hold any lens of the trial case. The lenses range from plane to + 5.50 D. by eighths to + 1.50 D. and by quarters to + 5.50 D. The supplementary lenses are + 5.50 and — 5.50 D.

These lenses are mounted at the end of a hollow arm 62.5 centimenters long, containing the shaft of the sprocket actuating the movement of the lenses.

Geared to the end of the arm nearest the operator is an indicator which shows only the number of the lens through which the patient is looking.

This arm, which is supported by a square cross arm permitting horizontal adjustment (for either eye), can be turned on its long axis, being held in any desired position by a squeeze collar.

The whole being vertically adjustable on the base permits the writer to do more exact skiascopy than he had previously been able to do because of the power to move rapidly back and forward, without change of position of patient or altering the direction of his gaze, from a stronger to a weaker lens.

For example, supposing the patient to require for reversal in the horizontal meridian a + 1.50 sphere, then by turning

alternately to + 1.37 and + 1.63 it is possible to tell more exactly which of the three is the lens to record. If now, without change of direction of gaze or distance of examiner the vertical meridian is found to be say +1.25 by alternating rapidly from + 1.37 to + 1.12 the astigmatic record is more likely to be exact than if the examiner had to remove the + 1.50 lenses, place them in the trial case, take out the + 1.63 lenses, wipe them, place them in the trial frame, seat himself, measure his distance, straighten the patient's head, get his gaze properly directed, compare with previous lenses, repeat this for +1.37, repeat for +1.25, rise, remove, replace, wipe new lens, adjust lens, adjust head, direct gaze for +1.37 again, and ditto all this for + 1.12. In the example given if the card were four meters in front the patient, the lens to be shown on the indicator would be + 0.75 for the horizontal meridian and zero for the vertical.

The unspeakable drudgery of all this with a restless, stupid or hostile patient has caused many men to neglect this most accurate of the objective methods, with consequent dependence on subjective tests, and often with final choice of lenses which would seem to justify Gould's most strenuous condemnation. Comparison of this inaccurate, difficult and time consuming process, with the ease and speed and accuracy attainable with the skiascope illustrated herewith impels the writer to believe that the refractionist will find it a great aid, both in saving time in the objective as well as in the subjective test to follow it, and in tending to greater accuracy of measurement. Skiascopy without cyclopegies in presbyopia will, I doubt not, be more often practised by all who use this skiascope.

A final feature is shown in the cut, namely, a stenopaeic slit, adjustable to all meridians, mounted in the disc so that subjective confirmation may be made at any time by turning back the indicator one diopter, plus the correcting glass required by the distance of the test from the patient, and requiring the patient to read the smallest line of the card.

A CASE OF TEMPORARY MONOCULAR AMBLYOPIA, POSSIBLY DUE TO EMBOLUS IN THE OPTIC NERVE.*

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PHILADELPHIA.

It is possible that this diagnosis has been assumed without sufficient ground, and yet diligent search among the authorities has failed to convince me of any other more plausible.

The patient was a woman of 21 years, who stated that while sewing, she noticed suddenly, partial loss of vision in the left eye. The work appeared as though covered by a cloud of smoke, and for two weeks previous to my examination the obscuration had continued unchanged. She had not complained of headache, or any physical disturbance, and has been, and is still, in her usual health. She has never had a similar attack.

The vision equalled 20/lxx, not improved by glasses, or changed under the influence of a cyclopegic. Careful and repeated ophthalmoscopic examinations showed absolutely no pathologic change in the eye ground. There was no arterial or venous pulse, no spots of exudation, no changes in the caliber, course or continuity of any of the arteries or veins. The foveal region was clear and the yellow spot was marked by the usual bright point of reflex. The field of vision was not defective, nor were scotomata present. The media were transparent.

She was admitted to the Jefferson Hospital and treated for five days by mercurial inunction and by 10 gr. doses of potassium iodide. Vision commenced to improve at once and on the fifth day had become 20/xx. Physical examination made at the hospital showed the presence of chronic endocarditis and insufficiency of the mitral valve.

The most interesting question in the consideration of this case is the diagnosis. A natural assumption, and one that would first occur to the examiner, would be that the amblyopia was hysterical. Fuchs says "that the diagnosis of hysteria is based principally on two points: The first of these is the absence of any changes in the eye which might explain the weakness of sight; and second, is the failure of the separate symptoms constituting the disturbance of vision, to show their

*Read at the meeting of the Section on Ophthalmology, College of Physicians, Philadelphia, Oct. 21st, 1909.

agreement with each other that they ordinarily present." Neither of these conditions was manifest.

In this patient, the blurring of the whole field, the absence of sector defects, or scotomata, or reversal of color field, the complete recovery in a few days, the freedom from the usual stigmata of hysteria, exclude hysteria as a probable diagnosis.

Dropsy of the sheath of the nerve might be considered as a possible explanation of the amblyopia. As against this view, are the unrestricted field, the normal appearance of the veins, the clearness of the nerve surface and outlines, the absence of hemorrhage and other signs of venous stasis. For practically the same reasons, pressure upon the nerve in the optic canal, the bony entrance into the orbit, may be dismissed. Hemmorrhage under the sheath or within the nerve itself, is hardly possible, because of the absolutely healthy condition of the retinal veins. Cortical, or cerebral disease of any kind, is presumably out of the question.

The diagnosis of embolus of one of the branches of the artery in the optic nerve was strengthened by the report of Dr. Kalteyer, who made the physical examination at the hospital. He considered it probable that a small vegetation had been dislodged from the mitral valve and carried by the circulation to the nerve.

It must be admitted that this diagnosis is open to question. As against it, may be mentioned the extreme rarity,—no case having ever been reported within my knowledge; the multiple supply of blood in the optic nerve (central artery of the retina, the small twigs from the pial sheath, and in some cases at least, the branches of the posterior ciliary arteries); the lack of interference with the course of the blood in any of the retinal vessels and the absence of edema of any localized section of the retina.

In its favor, are the sudden darkening of the entire visual field, the limitation of the loss of vision to one eye, and the endocarditis,—the last constituting an important factor in the etiology.

Wilbrand and Saenger consider the subject of sudden amblyopia limited to one eye, under the following heads: Retinal, papillary or retro-papillary. Under the last he has included embolus of the central artery and thrombosis of the central vein of the retina.

Under the retro-bulbar cases are mentioned:

First, hemorrhage into the optic nerve. The symptoms of this affection are described by Weiss: "A man of 54 years lost his vision 17 days before admission to the hospital. The loss was gradual, commencing as a floating dark spot before the right eye, which, in the course of six years had so increased in size, that vision was reduced to light perception. Many hemorrhages were found in the posterior part of the vitreous body. The papilla and the entire eye ground were hazy. The papilla was reddened, its borders washed, and in its centre a large clot of blood."

Second, edema of the sheath. Here again, the symptoms bear no relation with those of the above case. For example: Hamilton describes the condition following edema induced by an injury, which is more or less identical with that induced by hemorrhage into the sheath. Many other hemorrhages were found in the fundus. The veins in the neighborhood of the papilla were very narrow, and nearer the periphery, dilated. The arteries could not be seen." This description differs so materially from that of my case, that the two cases can not be considered as belonging to the same class. The occurrence of a central retino-chorioiditis, the ophthalmoscopic signs of which had disappeared before examination, might explain the symptoms, but the probability that an inflammation of this character was present at any time is so slight, that the suggestion may be dismissed with bare mention. Had an inflammation of a degree sufficiently great to materially lower the vision been the cause, even if its sudden onset could be satisfactorily explained, it is highly probable that some trace would have remained, particularly in view of the persistence for two weeks without change, of the diminished vision.

Cramp of the retinal arteries should be considered in discussing the question of diagnosis, as it seems from the record of a case recorded by Alexander, that in the early stages of the affection, it closely resembles the history of the above case.

A 19-year-old girl complained for a week of increasing weakness of vision of the right eye. At the time of examination, vision equalled 18/cc. The field of vision was concentrically contracted, color perception normal, pupils reacted slowly, and the eye grounds were normal. He made the diagnosis of retro-bulbar neuritis. Fourteen days later, the patient's vision de-

creased to 3/cc, and the ophthalmoscopic picture changed decidedly. The retinal vessels had become much thinner, the arteries resembling hairs, and were with difficulty differentiated from the veins. Arterial pulse by light pressure. Macular vision intact. There were no emboli. After four weeks, the vessels were again normal and vision had regained full acuity.

Raynaud claims to have seen with the ophthalmoscope, sections of the vessels while contracted in cramp, but Panas denies this possibility.

The valvular disease of the heart in my patient, one of long standing and quite marked, must be considered as the original source of the amblyopia. The course pursued by the embolus of fibrinous material from a diseased heart, was, of course, through the circulation, until it reached a branch of the central artery of the retina, and being too large to enter any of the finer branches, was stopped in its course by the wall dividing the artery from one of its branches, thus interfering a little with the stream of blood as it was passing into the retina, and obstructing totally that which should have passed into the branch.

The stoppage of the blood created no doubt an edema of the fibers of the nerve, similar to that frequently seen in the retina following embolus of one of the branches. The function of the fibers of the nerve was thus temporarily destroyed, with the resulting deterioration of vision.

The absence of scotomata, or of field defects, was probably due to the wide spreading edema, and not to its confinement in a certain area of the nerve. By the treatment, the edema was absorbed and the pressure was relieved, or collateral circulation was re-established, by which the function of the nerve was renewed.

There was nothing in the history of this patient while under observation to indicate inflammation or sclerosis of the vessels themselves. Moreover, the duration of the amblyopia was too short to admit of the opinion that a localized endarteritis was set up.

The future eye history of this patient will be watched with interest. It would be consistent with the diagnosis to anticipate future attacks of amblyopia, the degree of which would depend on the size of the exudations from the heart valve and the vessel involved.

SOME CLINICAL OBSERVATIONS UPON SYMPATHETIC OPHTHALMITIS.

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The question of the pathology and general management of sympathetic inflammation as well as sympathetic irritation, has not yet been decided. This paper is in no wise a resumè of the subject but it is for the purpose of reporting two cases, to discuss succinctly certain phases of the treatment and to show the micro-pathologic specimens of the same. Certain phases of this subject have recently impressed themselves upon my mind from clinical observation and it is just two points I wish to discuss. 1. Is there any benefit to come from the enucleation of a primarily affected or injured eye after a fully developed inflammation (plastic irido-chorioiditis) in the fellow eye?

2. Are we warranted in trying to save an imperfect or badly damaged eye and thereby jeopardize a perfectly good eye? In other words is it better to have one perfectly good eye the remainder of life or to have two defective organs of vision?

In regard to the first proposition, I think that most ophthalmologists are agreed, and the two cases reported certainly substantiate in a measure the correctness of this opinion.

In consulting references on this point, I find that ophthalmologists are almost universally agreed that if there is an active sympathetic inflammation in the uninjured eye, the removal of the injured member in no wise retards the inflammatory process, and in many cases it is better to try and save some vision in the offending eye.

CASE 1. Lucy T., age 18, in January, 1903, patient accidentally struck the left eye with a piece of glass. There was a rupture of the cornea at the inner inferior quadrant with prolapse of the iris and very little irritation when seen the next day. The iris was abscised, atropia and compress bandage applied. The eye healed with very little pain and irritation and a very small corneal cicatrix was left. Some opacity of the lens developed but this remained stationary and the patient was able to see large objects. In April the patient presented

herself again with some pain and ciliary congestion in the good eye. The injured eye was absolutely free from irritation. Atropine revealed a plastic irido-chorioiditis with deposits on the lens and in the vitreous. Vision was reduced to perception of light, so hazy had the vitreous become. Enucleation was not done because it looked then as if the vision in the injured eye could be made to improve more than that in the sympathetic eye. Drastic treatment was instituted by giving large doses of the iodides internally, subconjunctival injections of mercury and the normal salt solutions, the local application of dionin and atropine solutions together with active diaphoresis. Under this treatment the eye improved and today the patient has a vision of 20/lxx and the injured eye remains the same.

A short time before this case appeared, I read an article by Prof. Laquer, of Strassburg, who reported several cases of sympathetic inflammation practically cured by large doses of mercury and the iodides. This writer was very sanguine as to the ultimate result in all cases of sympathetic trouble should this line of treatment be pursued.

Some two years later the following case came under my care. L. C., 2½ years old, was brought to my office from a neighboring town on February 10th, 1905, with the following history: About the middle of last December, the child was playing in the back yard with a stick when he accidentally stuck it into the right eye. This latter became considerably inflamed but seemed to get well under home treatment as far as they knew. About Feb. 1st the good eye became inflamed and, noticing that the child could scarcely see, they brought him in for treatment. The left eye showed a marked plastic irido-chorioiditis with inability to dilate the pupil with atropine. The vitreous was very hazy and the fundus could scarcely be seen. The injured eye was atrophic and tender with a deep linear scar in the cornea. Enucleation was immediately done and active treatment instituted in the sympathizing eye. There was some improvement so that the child could see a pin on the floor. However, this vision grew worse again, although active treatment was continued and now the child is practically blind.

Case 3. N. F., male, age 15. On Aug. 20th, 1907, while using a hammer, a piece flew off and struck the right eye. I saw the patient the next day and found the following: Patient suffering no pain and there was practically no irritation about the eye. There was a rupture in the upper part of the cornea with protrusion of the iris. The eye was cocainized and the protruding iris removed. The giant magnet was tried several

times without result and without any signs of a foreign body being present. The patient's father was sure that no piece of steel went into the eye. Atropine and compress bandage was applied. The pupil dilated nicely and the eye healed without almost any pain. There was never the slightest signs of irritation in the good eye. A partial traumatic cataract developed. The patient was dismissed about the middle of September, with instructions to return immediately should either eye show the slightest signs of irritation. On Oct. 7th, the patient returned, saying that his good eye had been paining him for three days. Examination showed a circumcorneal injection. Atropine was used, which disclosed a plastic iritis and irido-chorioiditis with deposits on Decemet's membrane and opacities in the vitreous. I decided not to enucleate the injured eye, as the inflammation in the good eye was so far advanced. The injured eye was perfectly quiet. The patient was placed upon a strong solution of atropine locally and large doses of iodide of potassium and mercury internally. The next day the pupil was about two-thirds dilated, the irritation less, but marked deposits on the inner surface of the cornea and in the vitreous. Vision barely equalled fingers at one foot. Oct. 9th. All symptoms improved. Vision, 20/cc and with a plus three dioptre, 20/l. From this time on the eye improved and all symptoms of irritation subsided. In one week's time the patient was allowed to return home and the same treatment continued.

On November 29th the patient returned with the injured eye again inflamed and the uninjured eye the same as when last seen. On account of the pain and the idea that possibly this eye was still causing some irritation in the better eye, it was immediately enucleated, and a portion of the optic nerve resected. Healing was prompt and at the end of the week he returned home with absolutely no irritation in the remaining eye. Three weeks later the patient again appeared with considerable irritation in the left eye, in fact a renewed attack of irido-chorioiditis. This subsided under the use of atropine, hot fomentations and the alteratives internally. Strange to say as the result of the last attack of inflammation the deposits on the cornea and in the vitreous became less. The fundus could be very much better seen. Vision equaled 20/c and with correction 20/xx. There has been no further trouble and vision remains the same.

Was this betterment the result of the mercury and iodide internally, or due to the enucleation?

In the first case, which was not operated upon the result was better than in the second case, while as compared to case three,

this latter seemed to have the better of the argument as to the final result, although there was an acute attack after the enucleation had been done. Ophthalmologists are still not unanimous on this point and I must say that I am undecided in my own mind. If enucleation of an eye which has only the future possibility of some vision, will be of material aid in improving the already existing vision of the sympathizing eye, we should certainly advocate the operation. The second proposition is this: Are not ophthalmologists leaning too far towards conservatism in their efforts to save an injured eye, with a possibility at any time of having two defective eyes? Until our knowledge is more definite as to the etiology and pathology of sympathetic inflammation, we can never be certain but that an injured eye will be followed by an inflammation in the other. It is true that since the introduction of more thorough eye asepsis, the number of cases of sympathetic trouble may have decreased and yet when injuries do occur we are far from being able to say that no microorganism has entered the eye. I believe that ophthalmologists in their efforts to save an injured eye, frequently take too great a risk.

At the meeting of the American Medical Association in Chicago in 1908, Dr. L. D. Brose read a paper before the Ophthalmic Section on the management of "Sympathetic Ophthalmitis." I cannot agree with the writer in the views there expressed, and I think if such were universally adopted and accepted by the general practitioner we could be put back many years, the practice of ophthalmology of today. Dr. Brose warns general practitioners against mistaking simple sympathetic irritation, for sympathetic inflammation. This I consider bad teaching, for in the majority of cases it is even often difficult for experienced ophthalmologists to make this distinction, much less the man unfamiliar with eye diseases. If these ideas should be accepted, many eyes would be irrevocably lost. Rather teach the general practitioner that the symptoms of sympathetic irritation are the prodromal symptoms of sympathetic ophthalmitis, than that they are symptoms entirely distinct from each other. I thought for a long time that sympathetic ophthalmitis was a myth, but when three cases appeared in succession, my views were changed.

The writer in this paper urges strongly not to enucleate the injured eye so long as it retains vision on the ground that it may possibly prove the more useful of the two. I would rather

urge that the injured eye be enucleated immediately, and thus be positively sure that you will have one good eye. An injured eye, I mean, of course, one of any severity, hangs like the Sword of Damocles, over the future preservation of the uninjured eye, and the ophthalmologist never feels secure in his own position, as long as the injured eye remains.

I believe that the rules for enucleation as laid down by Swanzy and quoted in so many text-books, are as applicable today as when they were written. The almost universal use of the electro-magnet for the extraction of foreign bodies, has also made us bolder and where we see so many cases reported where not only the eye itself but also the vision is preserved, we are still more reluctant about enucleating this class of injured eyes. De Schweinitz no doubt expresses the views of most ophthalmologists of the present when he says, "It is universally conceded that the enucleation of an eye (preventive enucleation) primarily injured, the visual function of which cannot be restored, is the surest way of preventing sympathetic ophthalmitis." All perforating injuries to the eye, it matters not how trivial they seem, where the healing process leaves some portion of an incarcerated iris, put me in a state of mental fear for the future safety of the other eye. In these injuries even where we may expect a partial restoration of vision, and where the patient lives at some distance from the care of a competent oculist, I believe it to be better to enucleate immediately. It is much better to be almost positively sure of one good eye than to run the risk of having two defective eyes. It is true that enucleation is not always a surety against sympathetic troubles, but cases of sympathetic ophthalmitis where the injured eye is removed immediately after the accident must be exceedingly rare. Many brilliant results have been reported from the use of the electro-magnet, but it is also true that many of these cases have not been followed for long periods of time and therefore the final outcome has not always been ascertained. A case recently under my observation bears on this point:

K. J. L., male, age 23, while hammering a piece of iron, felt a piece strike his eye. There was immediate pain and loss of vision. I saw him three hours later on the same day, June 19th, 1907. Examination showed a triangular rupture of the cornea on the nasal side. Iris not prolapsed but caught in the wound. Posterior chamber filled with blood. No fundus

reflex. Atropine produced only moderate dilation of the pupil. Giant magnet used and the piece of steel extracted without difficulty. Eye treatment with atropine and compress bandage. Healing took place with very little irritation and pain. Traumatic cataract developed and the iris remained adherent to the wound. Patient returned to work on Sept. 1st, three months after the injury. On Oct. 26th he presented himself again at the office because of having been struck in the injured eye by a hot cinder. An abrasion was found at the sclero-corneal margin close to the old wound. Such severe pain and irritation developed and with marked sympathetic irritation in the good eye, that on Nov. 9th the eye was removed. All irritative symptoms subsided and there has been no further trouble.

In this case the eye healed perfectly, with every indication of a brilliant result but with a slight superficial injury two months later, a violent inflammation was produced, which required enucleation, because of decided irritation in the good eye. The result of this case was fortunately good, but how easy could it have been otherwise.

The finding of Fuchs in his micro-pathologic examinations for eyes removed for sympathetic ophthalmitis, has certainly opened up a new field for investigation, although it does not seem to be of much practical value as an aid to us in knowing when to enucleate for a possible sympathetic trouble. All are familiar with this work and it is therefore unnecessary to go into further details. The only possible practical value that such observations can produce, is on the assumption that a certain micro-organism is responsible for these peculiar epithelioid changes and if so, the possibility of discovering this organism and knowing that it produces certain changes which are associated always with sympathetic ophthalmitis. If we could do this, then we might know when and when not to operate.

I take the liberty of showing two sets of slides from specimens sent to Dr. E. L. Oatman, who has kindly written the micro-pathologic report. The first set shows the changes spoken of by Fuchs and which are from the eye of case 3, removed for sympathetic ophthalmitis. The second are sections from the eye of the last case, which was removed for sympathetic irritation and which according to Dr. Oatman do not show the changes. According to Fuchs' theory, it would not have been necessary to remove this eye.

Fig. 1. Case of sympathetic endophthalmitis. The inflammatory products are dominated by the polymorphonuclear leucocyte and appear **outside** the ciliary body. Low magnification.

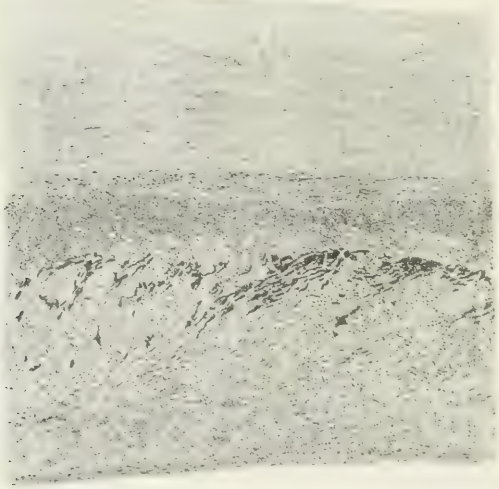

Fig. 2. Deposit, characteristic of sympathetic ophthalmitis, situated **within** the ciliary body. It has burst through the pigment epithelium and formed an exudate on the surface of the eye. The normal structure of the ciliary body has been **replaced** by a new tissue, consisting of lymphocytes, a few giant cells and epithelioid cells. The latter form a layer in the ciliary body adjacent to the pigmented epithelium. Low magnification.

Microscopic Examination of Dr. Dunbar Roy's Cases. By E. L. Oatman, M. D. From the Pathological Laboratory of the Manhattan Ear, Eye and Throat Hospital, New York City.

Dr. Roy particularly requests me to ascertain if the pathologic changes, found in the eye which caused sympathetic irritation, differ microscopically from those found in the eye which excite sympathetic inflammation.

Previous to 1905, it was believed that sympathetic and non-sympathetic ophthalmitis possessed a common morbid anatomy. In that year, Fuchs published observations and conclusions which, if confirmed by subsequent investigation, constitute a great advance in our knowledge of these conditions. A brief presentation of Fuchs' views render this report more intelligible.

The ordinary exudative or plastic form of iridocyclitis is manifested by inflammation of the tissues with mono- and polymorphonuclear leucocytes. The ciliary process pour out a purulent secretion, rich in albumin and fibrin, which surrounds the lens and appears in the anterior chamber and vitreous. The condition of endophthalmitis now exists, in which the tissues may become necrotic and form an abscess (panophthalmitis), or undergo cicatrization and terminate in phthisis bulbi. The early stage of this disease is marked by the preponderance of the polymorphonuclear leucocyte or pus cell. This form of uveitis is not supposed to cause sympathetic inflammation. The pathologic changes which, according to Fuchs, excite sympathetic ophthalmitis differ essentially from those just described. He says: "In the exciting eye we find the uvea distended with densely-crowded uninuclear leucocytes (lymphocytes). In most cases focal collections of epithelioid cells, which not infrequently have giant cells between them, lie in the midst of this uniform infiltration. Nodules are thus produced which often resemble tubercles. This peculiar infiltration often is present in only a few spots. In other cases the uvea is either largely or wholly occupied by them. Sometimes the infiltration makes its way even into the sclera, which is permeated with scattered nodules. In this way perforation of the sclera and extraocular proliferation may result. "At a later stage the infiltrating cells are replaced by dense connective tissue. The one characteristic feature of this process, is the proliferation of epithelioid cells within the uvea.

If these theories are valid, the eye which I am now examining should show, in the nonsympathetic case, a plastic inflammation the products of which are found on the surface of the uvea; while, in the sympathetic case, new cellular formations will be found within the uvea.

Report on this case which excited sympathetic irritation only: At the point where the fragment of steel passed through the cornea, the substantia propria and Descemet's membrane is replaced by cicatricial tissue. In this region is an adhesion between the cornea and iris. The cornea now exhibits the phenomena of an acute inflammatory process, which is most marked in and around the old perforation. The cicatrix and surrounding cornea are infiltrated with polymorphonuclear leucocytes, indicating the course of a pathogenic invasion which leads directly inwards to the adherent iris.

An acute iridocyclitis is in progress, as manifested by hyperemia and infiltration of the iris with mono- and polymorphonuclear leucocytes. The leucocytes have migrated from the tissues and appeared in the anterior and posterior chamber. The inflammatory process is more intense in the iris than in the ciliary body.

The lens is degenerating, partly absorbed and infiltrated with leucocytes.

The chorioid is thickened from hyperdistension of its vessels with blood.

The retina is the seat of chronic proliferative retinitis, attended by increase of neuroglia and formation of membranes around the vessels and upon the retinal surface. This condition is frequently observed after foreign bodies have lodged within the eye. To this chronic disease there is now superadded an inflammatory edema of recent origin. Over the inner surface of the retina are scattered leucocytes and pigmented cells which have been cast off from the ciliary body.

The fragment of steel, which was removed by magnet, was arrested by the sclera at a point 3 mm below and to the nasal side of the papilla. It passed through the retina and penetrated a large chorioidal vessel. The hemorrhage which ensued led to the formation of a dense, funnel-shaped membrane, the apex of which was attached to the point of impact and the base to the ciliary processes. The rent in the retina is filled in with connective tissue.

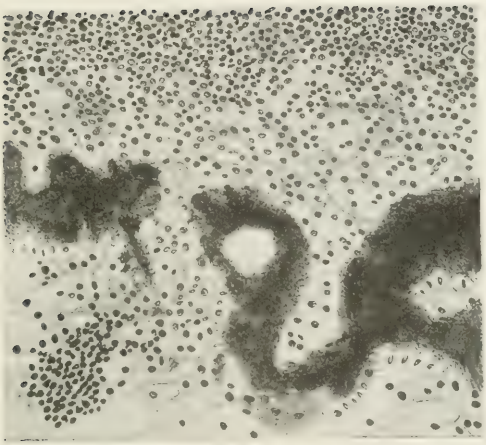

Fig. . Shows details under high magnification, of the deposit characteristic of sympathetic ophthalmitis. At this point the endothelioid cells of lymphoid tissue are breaking through the pigment epithelium.

This distinction is particularly emphasized by Dr. E. V. L. Brown.

The optic papilla is elevated by proliferated neuroglia and edema.

Microscopic examination of this eye reveals neither focal accumulations of lymphocytes nor unusual proliferation of epithedioid cells within the uvea. On the other hand, we find an acute inflammatory process dominated by polymorphonuclear leucocytes.

The diagnosis is exudative iridocyclitis (incipient endophthalmitis) which, according to Fuchs' theory, does not cause sympathetic ophthalmitis.

Report on the case which excited sympathetic ophthalmitis: The corneal wound, described in the clinical history, is situated about 1 mm. from the limbus. In none of the sections examined did it extend into the sclera. Descemet's membrane is ruptured, and the broken ends rolled inwards. The stump left from the amputated iris is incarcerated in the posterior lips of the perforation. The corneal wound is closed by a well-knit cicatrix, except at one point where the entire thickness of the cornea is occupied by a cellular deposit, continuous internally with the iris stump and externally with similar deposits situated in the sclera and episclera. These deposits are made up of lymphocytes with occasional epithelioid cells. Histologically, they belong to the granulomata. Many of the anterior ciliary vessels are ensheathed by nodules of lymphocytes. The episcleral tissue is thickened both from lymphoid infiltration and increase in its fibrous connective tissue. This appears to be a sclerosing process which has extended into the periphery of the cornea. From these findings, the epibulbar condition should be designated as episcleritis.

The most notable changes are observed in the uveal tract. with a lens of low power, the iris and ciliary body are seen to be thickened and nodular, presenting an appearance not unlike that observed in tubercular invasion. This resemblance is enhanced by the entire absence of fibrinoplastic exudation and adhesion. The chorioid is irregularly thickened from focal cellular deposits. With a lens of high power, the iris is found to be densely infiltrated with lymphocytes. Epithelioid cells are irregularly distributed throughout the infiltration. They occur singly and in groups particularly around the blood vessels

from the endothelial lining of which they appear to originate. The structure of the iris stroma is greatly altered: Its blood vessels are diminished in number, and the stroma cells have lost their pigment. There is a false appearance of plastic inflammation in and around the iris stump. This, however, is a reparative process, resulting from the original injury. No polymorphonuclear leucocytes are found in the iris or elsewhere in this eye.

The cellular infiltration is less uniform in the ciliary body than in the iris. Just beneath the pigmented epithelium, a broad zone of lymphocytes and epithelioid cells extend the entire length of the ciliary body and for a variable distance into the chorioid. In the region of the perforation, the epithelioid cells are proliferating luxuriantly and have burst through the pigment layer, forming granulomata on the inner surface. The cellular deposits have replaced the stroma of the ciliary process, many of which are filled with epithelioid cells. The musculus is densely infiltrated with lymphocytes and, in the more advanced stages of the process, all trace of original structure has disappeared. Wright's stain demonstrates large numbers of mast cells scattered throughout the iris and ciliary body. Giant cells and fibroblasts are occasionally found in the older layers of proliferation. These cells, however, belong to a later stage, namely, that of connective formation.

The deposits in the chorioid are composed of lymphocytes, irregularly distributed in the outer layers.

The vitreous is slightly albuminous. It contains pigmented epithelium, lymphocytes and epithelioid cells which have been cast off from the ciliary body. The retina exhibits an increase in neuroglia and edema. There is moderate lymphoid infiltration around the retinal vessels. The rod and cone layer is granular, but this, probably, is due to imperfect fixation of methods. The retina does not participate in the proliferative process present in the uvea, although at the orra serrata, granulomata have broken through and destroyed it.

The optic nerve shows proliferation of neuroglia and edema on the papilla. It is not atrophic, as demonstrated by Weigert's stain for medullary sheaths. No micro-organisms were discovered in the tissues.

Microscopic examination of this eye reveals infiltration of the sclera, corneal wound, iris, ciliary body and chorioid with

lymphocytes and epithelioid cells, with complete absence of exudative inflammation. The diagnosis, therefore, is proliferative uveitis which, according to Fuchs, constitutes the anatomic condition of the exciting eye in sympathetic ophthalmitis.

These two instructive cases conform, in every particular, with the theory that sympathetic ophthalmitis does not result from an exudative inflammation of the uvea, but from a slow formative process. It is true that the majority of eyes which excite sympathetic ophthalmitis, exhibit both exudative and proliferative changes. This is explicable when we consider that most cases follow perforating injury, which may implant a variety of micro-organisms within the eye.

The existence of epithelioid proliferation in the exciting eye, was noted long before Fuchs advanced the theory, that epithelioid proliferation is the essential pathologic condition in sympathetic ophthalmitis. In 1895, Hirschberg pointed out that the injured eye contained granulation tissue closely resembling tubercle. This led him to infer that the cause of the disease was a bacillus, which excited tissue proliferation, not a coccus of pyogenic organism.

The theories presented in this report have been corroborated by many observers, nevertheless, they cannot be considered as established.

If the morphology of sympathetic ophthalmitis has been discovered it should be demonstrable in every case. An apparent exception is described by Fuchs: A young man, nearly three years after perforating injury to the right eye, developed an iridocyclitis in the left eye, characteristic of sympathetic disease. When the right eye was enucleated and examined no proliferative uveitis was found. From the lapse of time between the injury and onset of inflammation in the left eye, it may be argued that the latter occurred independently of the original injury.

If sympathetic ophthalmia depends upon a specific micro-organism, which excites characteristic proliferation of tissue, we should expect the histological changes in the sympathizing eye, to correspond with those in the exciting eye. The limited number of cases examined, leave this question undecided.

BIBLIOGRAPHY.

Fuchs, E. Arch. f. Ophth. LXI., 2. 1905. Also, Lehrbuch der Augenheilkunde. 11 Auflage, p. 380-381. (Duane, transl., p. 388.) Brown, E. V. L. Arch. of Ophth. XXXVI., 2. 1907. Hirschberg, Centbl. f. p. Augenheilk., p. 80. 1895.

VISIBLE MOVEMENT OF BLOOD IN RETINAL VESSELS.

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Movement of the blood in retinal vessels had been observed in the early days of ophthalmology in a few instances, by Ed. Jaeger, Liebreich and von Graefe in local changes, *i. e.*, detachment of retina and in a case of "neuritis"—also by v. Graefe several times in the asphyctic stage of cholera. Subsequently the phenomenon has repeatedly been reported in cases of so-called embolism of the central retinal artery, in a majority of which, according to our present knowledge, it has probably been due to a local endarteritis proliferans. In the *Deutsche Medicin. Wochenschr.*, No. 45, 1908, Th. Rehberg gives the extensive history of a case of aortic aneurysma, observed at the University Medical Clinic of Koenigsberg, making the following statement regarding the eyes—"Vision somewhat lowered in right eye, F. V. normal in both. The retinal veins are relatively large compared to the arteries; the bloodstream, especially in the veins of the right eye, is markedly retarded and plainly visible, the blood column being divided into pieces of varying size, *i. e.*, from big granules to cylinders, which are separated by light interspaces."

From the literature at my disposal (there is also no reference in the literature given by Groenouw, Zusammenhang von Augen v. Allgemein. Krankheiten in Graefe-Saemisch, 2nd ed.) and the fact that Leber[1] in his exhaustive study, passing in review all experimental and clinical data extant, does not mention any similar observation, I believe Rehberg's to be the first observation of the kind, and I feel justified, therefore, in reporting a similar regarding the eyes though much worse, history which I have been able to follow (October-December, 1908) in my service at the University of California Hospital. Dr. Moffitt demonstrated the patient from the medical side before the San Francisco County Medical Society.

1. Die Circulations und Ernährungs verhältnisse des Auges, Graefe-Saemisch, 2nd edition.

I will only give the data in so far as they would seem to be of special interest here.

J. H., ironmolder, age 29. No previous illness. Nov., 1907, during work, sudden sensation of jumping of eyes out of head and dizziness. Gradually getting worse with pain in eyes and sensation of blood trying to rush through skull and attacks of roaring in ears. Sight gradually had been failing in both eyes, until July last permanent blindness set in in right—sight having been hazy for one day, it had gone out next morning entirely. Patient has been hoarse since March, 1908, suffered frequently from frontal headache, and at times the top of scalp seems numb. Sight has persisted in left eye, but has acted in general as in right. At present (Oct., 1908) it is very bad, hazy. Patient becomes blind in attempt to cross room. Spending his time in bed whilst in the hospital, patient sees best in sitting posture with head bent forward, sight getting dim and leaving entirely at times if he leans backward or even lifts head merely, but returns promptly on lowering head again. The temporal, facial, carotic, subclavian and radial pulses are absent on both sides, the brachial and ulnar present on either side, but weak. The femoral pulses are present and those at the dorsum pedis, right and left are strong. Reflexes are normal, and so are sensations, though pinching of the skin anywhere seems to be very painful. Left side of skull very dull, especially over parieto-occipital region. Tenderness over left parietal eminence. Frequent clots of blood in right nostril since beginning of illness. Left vocal cord at first moving less than right, has become paralyzed during stay at hospital (examined by Dr. Albert B. McKee). Trigemini in sensory and motor portions intact, corneal reflexes prompt. Facial nerves intact. Blood pressure on legs Oct. 7th, max. 220, minimum 160; Oct. 12th, 218; Nov. 21st, with Esmarch's on other leg. max. 150, min. 125, without Esmarch's 130 and 105. Patient had referred to occasional attacks of general convulsions with loss of consciousness and it was found that pressure on both carotids for about thirty seconds produces deep, noisy breathing with pallor of face and finally twitchings of face and arms, especially on right side. With twitching comes loss of consciousness, patient falls forward and respiration stops for a few seconds. Face then begins to flush and consciousness returns. On November 13th, whilst rising in bed, patient had momentary loss of consciousness with slight, but regular, epileptic attack.

Diagnosis by percussion, etc., and Roentgenogram: aneur

ysma aortae. Owing to the general condition of the patient, etc., the examination of his eyes is not as complete as might be wished for, especially re. c. vis., V. F., etc.—however, I feel satisfied that the essential diagnostic features were obtained through the ophthalmoscope. The tension of both eyes is decidedly lowered (T—I). Right eye amaurotic. Oct. 8th, 1900, optic atrophy with rather indistinct outline—the vessels, however, being normal in size, especially arteries not contracted, the evidence does not point to a distinct neuritis preceding. There are retinal changes close to disk towards macula, also upwards—and since analogous, though more recent changes in left eye are also confined near posterior pole, the process in right may be, perhaps, looked upon as a secondary, ascending atrophy of nerve.

O. S. Around posterior pole, though macula itself appears free, a number of recent degenerative changes in retina *under* vessels. Over main v. temporal, inferior two distinct roundish plaques of exudate.

Oct. 7, '08. In main branch of v. temporal, inferior O. S. a slow interrupted centripetal stream is observable, the blood column is divided into segments. This phenomenon is confined to the one vessel and to O. S.

Oct. 9. In the vein first affected the segments are longer, moving forward in a slow and jerky way. The same appearance as shown on 7th inst. by this vein is offered today by v. inferior nasal, and beginning in the other bigger veins, perhaps also in some of the smaller ones. Several of the big veins, universally broader, show a relatively smaller caliber at and near disk than some distance off. Disk somewhat pale as one would expect from the poor general arterial circulation.

Oct. 16. The current in veins is very slow, at times ceasing. The phenomenon is seen today in one vein o. d.

Oct. 21. No current visible in either fundus. Rosary appearance of affected veins.

Nov. 2. No visible current in either eye—o. s. shows rosary appearance of lower veins, which are universally smaller, though still extended near pa. Arteries also are a little smaller.

The patient, who had left the hospital in December last, was seen April 8th, a. cr. strikingly improved in general health (increased weight).

Patient makes no complaint regarding left eye. Vision H. m. + 0.75 = 1.25 ——. J. I. in O. 24 m., p. pr. O, 16 m., L. F. V. normal for white and colors, no central scotoma. T.

normal. L. P. normal and reaction n. Ophthalmoscopic n. (especially arteries n.).

Right eye T. n. Fundus n. outside of atrophic pa., which is now quite sharply outlined. The arteries in the fundus are everywhere decidedly large and of the same size as the veins, which are not enlarged. On the art. temp. sup. (only!) which, in spite of a main branch running in the same direction, is of the same size as the one accompanying vein, an unusually broad and intensely white central band (reflex from a thickened wall?) is present, no white lines alongside of vessels (under mydriasis).

As a purely physical phenomenon, there is no reason not to adopt in our case the explanation for the visible bloodstream given by Reimer[2]. If the blood flows normally the red corpuscles are whirled about so violently and carried off with such rapidity that on account of their smallness they cannot be made out. With decreasing velocity of the current the individual corpuscles become noticeable at first merely as smallest particles quickly shooting past. Gradually these particles, as a result of sedimentation and agglutination, increase with greater slowness of movement until we finally notice little cylinders separated by plasma. This last stage may perhaps best be compared after Dimmer* to the quicksilver toru to pieces in a thermometer, only that in our case cylinders, but of universally rather uniform size, came under observation. Omitting Reimer's closer argumentation, I will only add that Reimar was able to produce experimentally the several stages as referred to by pressure on the globe until he finally got a centripetal stream in the arteries—this being always the last of the changes that begin in the veins with minute particles flowing in normal centripetal direction. The clinical importance of these phenomena lies in this, "that blood circulation does take place as long as the blood columns, be they ever so thin in parts, or be covered (apparently interrupted) by thickening or clouding of walls, don't show in their farther continuity disintegration, *i. e.,* agglutination of the formed elements. Only when the blood column is broken up and the individual segments are at a standstill is one justified to surmise a complete interruption of the blood current. Absence of sponta-

2. Zeitschr f. Augenhkd., March., 1900.
*Der Augenspiegel, etc., 1893.

neous or pressure pulsation is absolutely not a sign that circulation does not take place."

That the circulation in the upper part of the body and in the head was being interfered with greatly is clear from the absence of the several pulses mentioned, further by the lowered T. in the eyes which according to Leber (l. c. § 118) can never be higher than the blood pressure within the eye, by which alone it is produced—and finally by the epileptiform attacks. Regarding the latter, Rehberg (l. c.) reviews the literature regarding experimental and clinical data in aortic aneurysm all being in favor of the cerebral symptoms being due to anaemia through mechanical interference with the circulation and not through excitation of the vagus. It is in regard to the additional opthalmoscopic findings, I think, that the chief special interest of our history lies. Leber's (l. c.) studies in their analysis of facts from human pathology as well as experimental have reference to complete obliteration of the circulation exclusively. Regarding clinical data Leber also considers the re-establishment of circulation after the complete block in the narrowed vessels stating expressly that the latter is a permanent feature. We have seen that at no time an arterial contraction has been found in our case and that, as a noteworthy feature, an enlargement even of retinal arteries was found in the blind right eye at the last examination. Looking upon this latter feature as of nervous origin we must yet refrain from trying to enlarge upon it in the face of the many contradictory facts found in experimental work to which Leber refers so exhaustively and judiciously. The further changes we have found in the retinal (whitish plaques, etc.) bring a clinical confirmation for Leber's findings and are of special interest in so far as they show the deleterious effects of a diminished blood supply even. The reason why this was sufficient to lead to atrophy of the optic nerve in the right eye would seem to lie in the great dependence of the retinal ganglion cells on the supply of oxygen [in contradistinction to nerve fibres (Leber, l. c.)]. In the absence of pathological pigment, even in the right retina, we can not say whether permanent changes have resulted through any process in the chorioid.**

For the general data in the foregoing history I am indebted to my colleagues, Drs. Moffitt and Ash.

**C. S. G. Nagel, Archives of Ophthalmology, 1900, XXIX., Nov. 5.

MASSAGE AS AN OCCUPATION FOR THE BLIND.

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PHILADELPHIA, PA.

No longer do we hear the cry of "Pity the poor blind." In these days the blind ask aid to work in order that they may assume their proper position in society. Those who are trained ask us to test their abilities,—and render them our sympathetic and efficacious assistance, but not our alms.

The erroneous idea that physical darkness implied intellectual darkness has long since been disproved and dispelled, for a long list could be given of blind persons who have become famous as travelers, statesmen, authors, poets, mathematicians, musicians and workers in handicrafts of various kinds.

Many are the occupations for which the blind are now being trained, some being of a manual, some of a professional, and some of a literary character. Not a few are in some way engaged in journalism. For instance at the office of the *"Petit Meridional"* of Montpelier, a blind person has charge of the telephone, receiving the news from Paris, which he immediately speaks into a phonograph. He makes the phonograph repeat the record which has been made; he then writes it off with a Remington typewriter, and in that way produces copy for the press. There are at the present time several blind persons in London and New York, at large hotels and factories, who are operating telephone switch boards, and others are reproducing with accuracy on the typewriter material which has been spoken into the phonograph.

Massage, however, seems to be an ideal occupation for the blind, one which is not greatly influenced by the economic changes of the world. It is far from being a new occupation for the blind, as for more than one thousand years it has been practised by them in Japan.

Professor Yoshimoto of Japan, who has been appointed the principal of the Model College for the Blind in Tokio, has recently paid a visit to the United States, and incidentally visited the Medico-Chirurgical Hospital in Philadelphia. He

*Read at the meeting of the American Academy of Ophthalmology and Oto-Laryngology, held in New York, October 4, 5, 6, 1909.

is very enthusiastic as to the employment of the blind as masseurs and urges their being trained for that profession. He reports that in Japan the blind masseur has proved very satisfactory and is highly appreciated by doctors and patients. In Japan the majority of the masseurs are blind and almost all the blind are masseurs, and until recently they possessed special privileges in that country. The students spend from three to five years at the schools for the blind. First they obtain a general knowledge of anatomy, physiology and pathology. Then they study minutely massage and the ailments which it cures. In practising massage they use only the hand, so that great attention is paid to improving the sense of touch and the training of the fingers to rapid and skillful movements.

Blind masseurs are used to teach the blind the art of massage.

Professor Yoshimoto tells us that blind masseurs know many ingenious methods by which they can well make up for the deficiency of sight. For example, though the blind cannot see the expression of their patient's faces, they can observe them just as well by lightly feeling certain muscles in the face, and see if their treatment is strong or weak. Indeed practising massage would not be an easy matter at all for the blind in Japan if they did not learn many ingenious methods which have been invented through the joint experiences of many clever blind massageurs.

In Yokohama, with a population of 500,000 souls, there are about 1000 masseurs and masseuses, of whom 400 belong to a corporation, 500 work upon their own account and 100 are sighted persons. In 1906 the Japanese Parliament contemplated making a law which would assure to the blind the monopoly of massage.

The National Institution for Massage for the Blind, which has its headquarters in London, has been rapidly gaining the cordial recognition of the profession and the confidence of the public. There are now more than sixty trained blind operators who are graduates of this Institution. Several during the first year, after completing their training, have earned on an average $400 to $500 a year. Many have found employment in hydrotherapeutic establishments, whilst others have successfully practised massage on their own account.

The work in London is under the presidency of Dr. Mal-

colm McHardy, and such prominent members of the medical profession as Sir Anderson Critchett, Drs. R. Marcus Gunn, Arnold Lawson, William Lang, J. Fletcher Little, etc., are active members of its Board of Managers. These names afford a guarantee of the efficiency of the training which the blind receive in the London Institution. There exists in this institution an inviolable rule that the masseuses shall only treat women and children, and that the masseurs shall only treat men. In other parts of Great Britain, especially in Edinburgh and Manchester, the blind are educated in the art of massage. Similar efforts to train the blind for this occupation have, in recent years, been made with much success on the continent of Europe in Stockholm, Copenhagen, St. Petersburg, Koenigsberg, Brunswick, Frankfort, Berlin, Liepzig, Kiel, Nuremberg, Brussels, Paris, Lyons and Lille, and in this country in New York, Boston and Philadelphia. At the Orthopedic Hospital in Philadelphia, where the department was instituted by the distinguished Dr. S. Weir Mitchell, systematic instruction in massage has been given to several blind persons. Fourteen of both sexes have been already graduated from this Hospital, and they have been more or less successful in practising the art.

In a previous paper on "Massage as an Occupation for the Blind," I have emphasized the importance of the most thorough training of the blind for practising massage. They should be healthly, well informed individuals,—they should possess refinement of manner, should have good moral habits; the breath should be irreproachable, and the hands should be well formed and smooth, being neither too fat nor too thin, and above all things, not moist.

Where the blind graduates in massage have been given an opportunity to show their ability, the results have proved very satisfactory, and it has been found that the blind can perform as good work as their sighted colleagues, and in some cases their blindness makes them even more acceptable.

As yet the number of the blind prepared to practise the art in this country is comparatively small, and the members of the medical profession have not realized what a blessing they would confer upon their sightless friends if they encouraged their patients to employ blind operators.

For the blind to succeed in this occupation they must have the

support of the medical profession and then their patients will receive the blind massageur with pleasure. It is to be hoped that all those who are interested in helping the blind to help themselves will do their utmost to recommend the employment of the blind as masseurs and masseuses, and give the operators an opportunity to demonstrate their ability to perform the manipulations with the same skill as their sighted competitors.

Massage, whilst being a new field of labor open to the blind in this country, ought to be an ever-widening one as surgeons and physicians come to appreciate its value and application as a therapeutic measure.

The New York Association for the Blind, which is carrying on a most admirable work at 118 E. 59th Street, at one time set apart an office for the treatment of massage by a skilled blind masseur, who was graduated from the Institution for the Blind at Overbrook, Pennsylvania, and was afterwards trained for massage at the Orthopaedic Hospital in Philadelphia, Pa. The office was not much patronized and the room has recently been used for other purposes. I learn through Miss Winifred Holt, the gifted and indefatigable Secretary of the New York Association for the Blind, that it has been a disappointment that so little progress has been made with the public in inducing it to employ blind masseurs. However, it is gratifying to learn that a young masseuse, in whom the officials of the New York Association are interested, is meeting with considerable success in that city. She lost her sight five years ago, and took up massage as an employment. The doctors for whom she works, among them two at St. Luke's Hospital in New York, speak of her ability in the highest terms. One of the smaller hospitals in the city being desirous of giving lectures on massage to the nurses in the Institution, has engaged this young woman to give this course.

In a previous paper I referred to Mr. William J. Nealon of Philadelphia, who lost his eyesight on the eve of his being graduated as a Doctor of Medicine. He studied massage, for which his anatomical and medical knowledge particularly fitted him, and he is still successfully and acceptably practising his art in Philadelphia, and is officially attached as Masseur in Chief to the Howard Hospital. He also practises massage in St. Agnes' Hospital.

These two instances illustrate the ability of the blind to administer this valuable adjunct to medical and surgical treatment, but it is as yet a novelty to the profession and to the public in this country. The time is, however, at hand, we believe, when the Superintendents of Hospitals and Sanitaria, as well as the members of the profession generally, will realize that the blind can be as thoroughly trained, and can as efficiently administer massage, as any sighted person.

It seems to me that if this work is to prosper in this country, it must be carried on as in London, directly under the auspices and fostering care of members of our profession. In England several physicians have announced that they will employ no other than blind masseurs for their patients, as their delicacy of touch enables them oftentimes to detect structural changes which are not appreciated by the sighted.

CONJUNCTIVAL AND OTHER REACTION TESTS TO TUBERCULIN IN TUBERCULOSIS OF THE EYEBALL AND ITS ADNEXA[1].

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From a search into the literature of this part of the general subject[2], and a personal study of the variously employed methods of testing,[3] the author has come to the following conclusions:[4]

1, Conjunctival-reaction and other nearby placed reaction tests to tuberculin are of determinative use in the etiologic diagnosis of incipient and uncertain cases of curable primary tuberculosis of the eye and its adnexa: In fact, many eyes are later greatly impaired and some lost by not making such an early differential diagnosis. These special forms of tests

1. Vide processional volume of the 1909 meeting of the American Ophthalmological Society.

2. This communication is limited to the gross clinical ophthalmic aspect of tuberculin testing. Extra care for scientific certainty in the obtainance of premises for the offering of dependable conclusions for general employment has been taken in the studies. No attempt has been made to discuss the various well-known toxic, antitoxic, bacteriolytic and phagocytic theories of action.

The author is at work upon a brief practical article which will consider the comparative values of the different forms of tuberculin material and the relative effects of graded dosages of the same, upon proved cases of tubercular disease of the eye, without regard to refined laboratory methods, which cannot be resorted to by ophthalmologists who are not in touch with such opportunities.

3. For valuable information, for privilege of studying cases, for help in technique, and for co-operation in these studies and others upon related subtropical diseases, made by the author during a recent four months' holiday in Southern California, Mexico, and Cuba, he is under obligation to Drs. Francis M. Pottenger, Joseph E. Pottenger, and J. Neall Robinson of Monrovia, California, to Dr. G. Walter Holden of Denver, Colorado, to Dr. Henry Page, major U. S. A., to Drs. Henry Dickson Bruns and Ernest A. Robin of New Orleans, Louisiana, and to Drs. J. Santos-Fernandez, John Guiteras, Enrique Acosta and Federico Torralbas of Havana, Cuba.

Dr. Leonard D. Frescoln, assistant chief resident physician at the Philadelphia General Hospital; Dr. Randle B. Rosenberger, pathologist to the hospital; Drs. Jay C. Knipe, the author's assistant ophthalmic surgeon, and A. R. Keith, his resident surgeon, in the same institution, have kindly helped in some of the practical work.

To Dr. Charles J. Jones, the author's assistant surgeon at Wills' Hospital, to Dr. Emory Hill, resident surgeon at the hospital, and to the author's efficient corps of clinical clerks in his immense triweekly service at the same place, thanks are here given for their special studies by which this communication has been rendered possible.

4. It must be remembered that a so-called "professional communication," publicly given like this some several weeks before its personal reading (and its necessarily, previously prepared discussion), must be considered as expressive of the author's thoughts and beliefs at the time that the manuscript left his possesison. The significance of this, from a scientific standpoint, can be best understood by those who are in constant relation with the almost daily changes of opinion brought about by continuous experiment and recurrent observation among many similar cases.

are of clinical service in this fast being recognized limited class of cases, by reason of their inexpensiveness, their ease of employment, their rapid absorption into the ocular and surrounding tissues, their ready differentiation in uncomplicated cases, and their quick production of toxin reaction-results; becoming delicate additional provings of local tubercular disorder with good resistance powers, to capable and experienced clinicians.

While primary tuberculosis of the eyeball in a mild and chronic state, if left undisturbed, does not often directly destroy the eye beyond useful functioning, yet in view of this very fact, all tuberculin reaction-tests should be employed in such cases, as, at times, they are confirmative of the etiologic character of the existing disease by aggravation of the ofttimes necessary-to-be-determined signs and symptoms. They cannot, however, be considered as pathognomonic of conditions that are of tubercular origin or complication alone in all instances. They must, whenever possible, be supplemented by clinical data as to temperature, pulse, tuberculo-opsonic indices, etc. At present, they are, nevertheless, as good as any other single test.

The conjunctival methods are employed to the safest advantage, and should be used only in those rare types of suspected adult cases of eye disease in which there are not any gross signs and symptoms. Furthermore, in cases of apparently healed ocular inflammation in which there is any doubt as to the possibility of a conjunctival test exciting an exacerbation, the dermatic method[5] should be the one employed. The cutaneous test, properly done, and made either in the easily seen corresponding temporal or aural region, or preauricular region if the underlying glands are not involved,[6] has, with a greater degree of usefulness, particularly in disease of the anterior segment of the eyeball, a harmlessness of action and a surety of result which makes, as compared with the conjunctival method, the preferred form of testing in most cases; particularly in children.[7] Both tests, however, are invaluable in the determination of tuberculosis of the ocular adnexa, and

5 Vide infra

6. As a rule, the preauricular glands are coarsely involved only in the gross types of tuberculosis of the eyeball and its adnexa.

7. The employment of the usually made contiguous "blank tests" is of no practical value in ocular cases, when the methods are made in the positions preferred by the author, as the secondary reactions of the eyeball or involved adnexa in positive results, are better and sufficient comparison signs

never, in one form or another, should be omitted, in apparently appropriate cases; the grosser the reaction in properly selected subjects, the greater being the certainty that there is a nearby tubercular focus. Where there are local septic infiltrates above certain amounts or to degrees of virulency which are greater than those which can be withstood by an already tuberculously injured eyeball, the carriage of extraneous tuberculin products into or around the organ, with the freeing of resident encapsulated tubercle bacilli, may, through their toxins, give rise to such coarse reactions, that all such locally applied testings become a menace to the preservation of the eyeball. The possibility of primary ocular tuberculosis by direct infection from the use of the tests, though remote, must be considered.

As yet, no surety as to the degrees of the different reactions in any of the methods, can, by reason of the uncertainty of strengths of the materials used and the changeable resistances of the tissues that are attacked, be given:—as with other applications and administrations in their experimental stages, the questions are mainly those of empiricism. Teleologically, the earlier that moderate degrees of reaction are obtained, the more rapidly will restitution of the involved parts take place. In all of the positive cases, the early and the late local signs and symptoms of reaction—both primarily, at the point of testing, and secondarily, in the suspected region, as well as the induced general temperature changes[8], become more interesting, and are not unlike those that are found in other forms of similar testing.

The materials used, to be of any value, should be approved and freshly prepared ones. They must be employed in the smallest efficacious amounts that are possible[9]. The percen

[8] Variations of from one to four degrees Fahrenheit.

[9] Although there is a widespread movement towards the standardizing of the percentages of the different forms of tuberculin to be used during such tests, none have been generally agreed upon. The author has based most of his interpretations upon the actions of varying strength suspensions of different forms of testing material ("Bacillen Emulsion," "New Tuberculin," "Old Tuberculin," and "Spengler's Fluid in Tuberculosis"), upon a sufficient number of carefully selected cases from his abundant resources, for proper generalization. Thus far, for mere empirical reasons, he has preferred "New Tuberculin" for therapeutic purposes. He has made, and is making, much new experiment in various ways, in regard to the questions of "group reactions," as to both the initial and the subsequent dosages of the different kinds of the material, the relative actions of the weakest possible suspension strengths in tuberculous and supposedly nontuberculous subjects, the adaptations of the methods of application (such as mixed testings), and the conditions and the relative positions of the testing and the suspected inflammatory areas. He and his assistants are engaged in investigations upon the consequences of heredity—particularly along the maternal lines, the character, the age, the chronicity, the paramount type of case, and the effects of the testings upon the behavior of the irides. He hopes soon to have some

tages of strength of the initial dosages should be carefully, though, necessarily, at times, empirically gauged by ophthalmic experts. This is especially true for the conjunctival test—the most dangerous method—in spite of the fact that the membrane is a more or less washed and movable one.[10]

Both before and after any form of instillation, denudation, withdrawal of lymph or blood, injection, etc., the subject should be kept quiet and freed from interference with or precipitation of both the general and the local lymph and blood stream circulations. In reality, it is neither scientifically correct nor conscientiously just to apply any of the tests to ambulant subjects: This is well illustrated by the occurrence of the increase of local disturbances, both in the tested and the inflamed areas, simulating those of test-reactions at times in any type of case, and the not rare production of slight and slow increases of local temperature, arterial tension, pulse rate, and general pyrexia to not inconsiderable degrees upon undue fatigue, when carefully searched for, in true cases: a clinically well-known irritability of thermic, vasomotor and glandular centres. Complications from intercurrent diseases, especially of the blood and lymph constants (exanthemata particularly), menstruation, etc., should be considered before the making of the tests. Traumatism, especially when complicated by coarse incursions of extraneous bacteria—particularly of the ectogenous varieties—should be guarded against.

Broadly, no tuberculin therapy addressed to the eyeball and its adnexa, should be employed before a local tuberculin test has been made, either conjunctivally, or, better and safer, cutaneously, in appropriate cases. According to some, the intravascular method made as near as possible to the affected eye, if permissible, is still better, and should be the one used. In accordance with others, a testing obtained directly from the

of his colleagues make studies with nearby so-called lupus, and continue investigations with the lacrymal and sinus types of the disease. The effects of the various kinds of material, as, for example, the dried forms, the autogenous and stock products, the homogenity of the suspensions, the brands of the preparations, combination material, etc., he hopes to have others interest themselves in. In addition, he has ordered a series of cytologic control studies to be made upon the conjunctival excreta. All of these experiments he trusts will be done in varying useful ways from ophthalmic standpoints alone. He will help see that they are published by the observers, should the results obtained warrant anything which is worthy of record.

10. Approximately, in many of the early cases of this study, the average dose employed in this method has been about one-half to three-fourths of a milligram. In a later number of instances, both less and greater strengths have been used. In the cutaneous method, great variability in the strengths of the test dosages have been safely and usefully employed. (Vide supra.)

lymph and the blood of the organ itself, if these can be obtained in sufficient quantities without undue traumatism, is probably the best preliminary one.[11]

To be of any scientific and systemic value, the studies in tabulated detail, should be recorded in every instance for purposes of generalization, not only for themselves, but in order to obtain a proper appreciation of their relative values as compared with other correctly made similar ones. The coarse clinical divisions of degree of reaction as usually given, are but gross empiricisms, that would be better gauged in respect to the relationships of the types and the amounts of the bacterial products as determined in various ways—in regard to the positions and the conditions of the reaction areas; and in reference to the apparent activity and health of the subject—as periodically and repeatedly studied.[12] The relative proportions, the characters, and the behaviors of other bacteria and the lymphocytes, etc., in the reactions, must be considered in each case; a marked increase of lymphocytosis, for illustration, offering itself in many instances, as confirmative evidence. [13]

11. In regard to the possibility of obtaining this last method practically and usefully, the author and others are at present engaged in determining. Condemnation of the plan or of the tuberculin test question at large, should not be indulged in by those who have not the inclination, the opportunity, and the time for careful experimental study or for continued practical application. Opinions must necessarily change, views cannot but differ, and methods must alter, before the subject can be generally offered with a certainty which will not admit of cavil or dispute. Then, and not until then, can the entire question, if, as the author believes it will, become a triumph of certainty, and be authoritatively employed to determinate advantage. In the meantime, ophthalmologists should act for the good of those who are entrusted to their care in accordance with the advantages of the widest knowledge and the broadest certainty of the subject, which they possess.

12. A plan which may be readily employed, just (as for example, should the conjunctival test be the one which is used), as is done at present by scientific ophthalmic clinicians for the recognition of the different forms of microbic conjunctivitis, and the regulation of the therapeutic measures made use of in their treatment. The only practical scientific method of study of the condition of the conjunctiva before the employment, is both clinical and bacteriologic—particularly the latter—in order to have a better comprehension of the type and the condition of the prevalent germ present, and the probable character and state of the protecting faunal cells.

13. Any tuberculin reaction tests, which are applied to the unbroken squamous surfaces of the conjunctival, the nasal and the pharyngeal mucous surfaces, must, to be effective, pass into the living cells of the membranes; just as the so-called "percutaneous," "inunction," "blister inoculation," etc., methods, must all become cutaneous (dermatic) or even, in some instances, subcutaneous (hypodermatic)—one of the most dangerous avenues into the system. The older, primarily "subcutaneous" and "stichreaction" methods have not been considered in this series of studies, being reserved for a later communication.

As to the theory of the action of suspended tuberculin upon the thus exposed living cells and tissues of a tuberculous subject, being—for example—dependent upon a stimulation of the supersensitive cells to form protective substances, with the hyperproduction of antitoxins, which, by action upon the bacilli, liberate inflammation-producing endtoxins,—is, in the present state of the knowledge of the subject, uncertain, and has nothing to do with the province of this paper. This statement is also true of the more recent belief of the endowment of the toxins with antigenic powers, and the theory of the production of extoxins by bacteria which contain or produce endtoxins.

Whether it be true that a bovine or other form of faunal tuberculin will give better and safer reactions, or not, in the human subject, remains to be proved by experimental and clinical observations.[14]

The method of the recording of the reactions should be the outcome of a consensus of opinion of combined general and special authority. As an example of the importance of this, experience has shown such a variability in the character of the ordinarily given grades of the reactions, that individual differences must be expected, and should be noted in detail for further reference and elucidation.

When the tests are properly managed, they may be safely employed for diagnostic determinations, therapeutic procedures, and prognostic purposes, in appropriate cases. When judiciously so used, they become of value. Under these conditions, the differentiating powers of the materials assume a necessity for the careful and skilled ophthalmologist. Whether these tests can replace other proposed clinical methods for the detection of primary ocular tuberculosis by the general practitioner, is dubious. Their ease of employment, and hence the possibility of their widespread use if scientifically sanctioned, and their great dangers when ignorantly, carelessly or repetitively applied, render the most dangerous of them—the conjunctival—unwise of general approbation in this class of cases. By some competent authorities, it is stated that the conjunctival test is the less uncertain and the more valuable in the determination of weak reaction types of the deeply seated ocular lesions of tuberculosis—as for example, chorioiditis in the adult. By others, it is asserted that the cutaneous test is the safer, and the one to be preferred in the coarser and the more superficially seated ocular expressions of possibly ectogenous type—such as low grade chronic forms of keratitis,—in the young. A few authoritative ophthalmologists believe that a positive result by the former method is expressive of an active tuberculosis. For general employment—the safer— the cu-

14. The author is interested in this question, and two of his friends are methodically at work upon it. At present (December, 1908), he believes that it is probable that the tubercle bacillus is a generic type with interchangeable anatomic, physiologic and pathologic variations dependent upon habitat, environment, etc. Study and knowledge of the particular causal tubercle bacillus in each case will, it is hoped, be soon brought into useful association for the determination of the best forms of test and therapy material, and their applications.

taneous test, is the one which should be generally recommended.[15]

II. These especial forms of tests are of both determinative and confirmatory value in the diagnosis of uncertain and curable tubercular disease of the eyeball and its adnexa of systemic origin, particularly in those cases in which there are not any coarse general or localized etiologic signs and symptoms. These applications of the tests in these erroneously considered rare ocular expressions of the general disease, are invaluable[16]: The localized lesions of incipient tuberculosis of the eye and its adnexa, though generally fairly well isolated by avascular walls—thus giving difficulty for the entrance of tuberculin material for the production of the reactions,—may be so easily aroused into coarse and dangerous activities, that the necessity for the careful performance of one of the nearby tests becomes the preferable method in all such cases.[17] Moreover, individual peculiarity, age, phases of allergetic or altered energy peculiarities, as regard both the local tissues and the general structures, even without reference to the presence of any apparent disturbance, must be expected, and considered in all cases. The so-called delayed positive reactions, which are often quite gross, well illustrate this.

Control tests, simultaneous direct examinations of the blood and the lymph for the tubercle bacillus itself and its products, and painstaking determinations in regard to the effects of resultant toxins in the serum and the urine—as most probably will be rendered possible by better methods of precision, etc.,—are frequently necessary. Simultaneously performed and nearby placed control tests should not be made in this class of cases, as any coarsely produced traumatism can act as an addi-

15. These statements admit of so much argument that detailed statistics by careful and competent investigators, are necessary, before they can be accepted and sanctioned.

The relative degrees of sensitiveness of the series of tests with one another and with other similar tests, such as the agglutination method (a still difficult and uncertain plan of procedure in tuberculosis), as applied to this particular phase of the subject, is still sub judice, and offer excellent fields of comparative study, particularly in regard to age of subject; questions as to healing; sepsis, etc. Some of the author's colleagues are already engaged in a detailed study of these questions. As far as his own experiments and practical studies have gone, he has not seen any harm arise from the proper application of the conjunctival test in cases of low grade chronic inflammation of the posterior and middle thirds of the eyeball.

16. They are probably but precursors of other, better methods, that will be usefully applied for the early recognition of local, ocular expression of general infections or so-called dyscrasia; as, for example, direct studies of the ocular lymph and blood.

17. In this connection, one of the direct intravascular methods, when able to be properly performed near or in the ocular tissues, may be considered as the most certain of all

tional focus for reaction, which, as the least harmful effect, may give rise to uncertainty of proper signification of test-result.

The interpretation of positive findings at the sites of the testings and in the inflamed areas, need not be always that of direct relationships as regard the local and the general conditions; as for example, ocular traumatism, which bears no direct association at first with the general health, may take place in subjects who are temporarily tubercular to reaction degrees, as so many urban dwellers, necessarily, are. Here the positive findings may be valuable in showing that an endogenous tubercular invasion to traumatized parts has taken place, as is so often seen in other cachexia—for example, in syphilis;[18]—offering a new nidus of tubercular infection which may become harmful in its effects upon the invaded organ. Again, as is so frequently shown throughout this article, latent ocular tuberculosis, both superficial and deep, without any previous coarse local signs or symptoms, may be brought into gross clinically recognized activity. Excitation of deeply seated orbital and sinus disturbances may be also produced by the employment of the tests.[19] Moreover, general latent tubercular conditions, without any coarse clinical expressions—as are so often seen after death in unsuspected cases, may be aroused; and both concealed nearby or distant foci—though the latter to but slight degrees—may be reopened by these local methods. In the systemic forms of monocular disease of tubercular type, involvement of an untouched fellow eye early after the test—before any ectogenous infection has taken place,—is strong corroborative positive evidence. The probability of the direct carriage of tuberculous material or its products, from one or more undisturbing and practically harmless distant focal centers of tubercular deposition to the ocular structures, by the

18. It is probable that convalescent cases of typhosus-bacillus infection react in part, to the test from inherent hypersusceptibility to the bacterial albumin in the tuberculin; the two series of floral germs probably being either related in type or in kind, or their products made to contain similar relationships of material (see author's previous communication upon typhosus bacillus). It is also possible that the reaction may, and does occur, by the combined or independent action of other toxins than those of tubercule bacilli.

19. Cases of even fresh hemorrhagic extravasations from the chorioidal and the retinal vessels following both the diagnostic and the therapeutic employment of tuberculin used conjunctivally, cutaneously, and intravascularly, have been recorded. Hence, such complications can be considered as confirmative test-evidences of the tuberculous character of the disease; and if so, it is ofttimes better that they have occurred, than to have had any activity started by some accidental or intentional traumatism without the true cause having been known; and hence the results not intelligently and successfully treated.

testing, as has been elsewhere pointed out, must be remembered; though, as previously shown indirectly, the proved presence of tubercular foci in distant parts of the body is not necessarily determinative of the character of the eye lesion. Other clinically pronounced dyscrasiae, which seem to have either a tuberculous basis or a tubercular association of hidden type, tend to increase the severity of any reaction, and must be considered in every suspected case: in fact, in some of the instances of supposed nontuberculous dyscrasic disturbances in which the reactions are said to occur, there are probably true tubercular entities of minor degree. Further, it must not be forgotten that some subjects may present conjunctival irritation during the general use of certain drugs, of so-called venoms, of serum mixtures, etc., making it best to omit the employment of such materials for some time previous to or after the performance of the tests.[20]

In spite of the fact that by reason of low opsonic index[21] with but little or no resistance to tuberculin, in old and coarse cases of both general and local tubercular infection, in which the clinical signs and symptoms are ample for diagnosis, appropriately and properly applied tests may, and do,—fail, yet in view of the most recent beliefs as to the causation of local reactions, a local negative one in such systemic cases, may be, in some instances, interpreted as showing that the ocular tissues are not at the moment actively or grossly involved as a part of the general diseased state. By some it is assumed that by reason of failure of local release of endtoxins, there is not any primary reaction in cases of so-called acute miliary tuberculosis: In such patients, the bacilli may be cultivated from the blood.[22] By others, it is asserted that the tests, if properly done, never fail of positive reaction in the ocular expressions

20. It is doubtless incorrect that a normal subject can have a true tubercular reaction to any form of properly made testing, as has been asserted by some; a proof to the author's mind, of error in detail, etc., and hence in interpretation. In every systemic case of ocular or circumocular reaction, there must be some special dyscrasia at work—some definite character of chemical change as it were,—by which a localized lymphatic and vascular reaction in the ocular structures or neighboring tissues, is produced in each instance.

21. While difficult and time-taking, the control offered by the laboratory method of inoculation studies of the opsonic index, makes its employment a necessity for scientific accuracy in such work as this.

It may be of interest to note that there is less variability in fluctuation in the tuberculo-opsonic indices in the early remediable cases, both before and after the tests, than in the incurable advanced ones, in which there is much systemic involvement.

22. Systematic study in this direction is needed before this assertion can be considered as settled.

of the early and the minor grades of general infection, thus offering themselves as valuable signs and symptoms that are eminently expressive of the general dyscrasia.

III. These tests cannot be considered as of determinative or even confirmative etiologic value when they are made in, and upon tissues that are the subjects of extraneous or nontubercular inflammatory reaction. This, of course, narrows their usefulness to the scientific determination of the cause in this special class of ocular disease, to those cases in which the tubercular disturbances are of such a grade and type that the tuberculin tests will not injure the eyeball and its functioning. The very fact of limitation however, is of value, when it is considered that such cases are the ones that are the most easily cured; and hence the usefulness of the employment of the etiologic tests. As has been shown, false interpretation may arise in many ways, and must be considered in every instance. Many of the adverse reports given by other than competent ophthalmic experts, and which have been merely either descriptive of gross carelessness or expressive of ignorant empiricism, are illustrative of this, even though they have been not considered as such by those who are fit to judge.

IV. The tests, to be useful, must be kept free from technical complication. They should be made upon undisturbed and carefully prepared fields. They can be considered only positive when it is certain that both previous and after intentional or accidental traumatism can be excluded. The fact that any type of former local disturbance may give a nontubercular reaction, which may be falsely believed as a true one, should make experimenters careful in interpreting results in cases which have come from beneficial societies; among those who are liable to enforced army and navy service; in emigrants; and among those who are resident in compulsory institutions and detention hospitals, etc.

The necessary uncertainty of technique in such methods, the relative conditions of the overlying epithelial plates and the underlying living cells of the conjunctival membrane, the comparative states of the epidermal scales and the dermal tissues, the relationships of the local manifestations and the general disease, the freedom of the related lymph channels and the vascular canals, and the nature and the activity of the contained lymph and blood constants, all, as in part previously noted,

tend to render the tests in ocular and related disease of tubercular nature, indefinite in result, not only most lamentably, as has been shown, to the careless and the ignorant, but in measure, to the careful and experienced. In consequence, no conjunctival tests should be made by any but experts in eye diseases, nor any of the nearby methods performed until after authoritative opinion has been given that any given eyeball will not suffer from properly obtained amounts of reaction. In every instance, where advisable or possible, the patient or the patient's guardian should be made acquainted with the import of any form of testing. Periodic studies of the induced conditions, using the fellow eye or related area, if apparently healthy, for comparison, should be made; regulated general care and watchfulness by the best methods possible, particularly if coarse constitutional disturbance be present, must be enjoined; and prolonged control of the subject, if necessary, should be insisted upon.

V. These special varieties of local tests are more dangerous to the integrity of the eyeball, than any other form of tuberculin test. As constantly noted, their use in bulbar disease must be fraught with much prudence: Disturbance of the lacrimal, orbital and palpebral tissues are more capable of safe study by their employment. If the conjunctival test be the one chosen, both eyes should be completely studied, and, as before stated, found free from gross inflammation. A single small application, although giving a reaction which is so slight that expert opinion is necessary for interpretation, is the one which is the safest, and the one which is to be generally recommended. The employment of larger amounts of test-material should be guided by the judgment and the decision of competent ophthalmologists. In most cases in which ectogenous infection is not suspected nor seen, any minor degrees of over reaction, may be quickly and harmlessly removed by warmed collyria composed of weak strengths of cocaine (if safely necessary to employ) in saturated solutions of boric acid, with rest, freedom from use of the eyes, etc., for a few days' time. Weak strength solutions of glycerine for the extraction of the tubercle bacilli have been recommended in some appropriate cases. Adrenalin has been used by a few competent clinicians.[23]

23. In grossly complicated reactions, which the author has never had the ill fortune to see in any of his personal work, the fellow eye should be pro

The usefully employed cutaneous tests, even when made in the situations previously directed, are comparatively free from danger to the integrity of the eye in many forms of ocular disease of tubercular nature. They need be only feared when placed in the hands of careless and ignorant experimenters. In cases of coarse disturbance of the eyeball and its adnexa, some more innocent form of study by which the presence of the bacillus or of its products *in situ*, may be determined without undue traumatism or increase of irritation or inflammation to the involved parts, such as direct observation of the lymph and blood, and even the living tissues, should be resorted to; procedures, which, no doubt, will be soon brought into practical application.

Mixed infections, which so readily take place both ectogenously and endogenously—as for example, the reported ones of septic lymphangitis in the cutaneous tests,—must be, as hinted at throughout the article, strictly avoided, as not only ruinous to the value of the test, but, what is worse, as injurious to the organ. At present, the cutaneous test is the one which should be preferably recommended and employed until safer and more useful ones appear:—until better clinical methods and improved experimentation will give more broadly opened expressions of the ocular manifestations of tuberculosis from the mildest impregnation of the tissues of the eye with infected lymphoid material to the coarsest tubercle formation in the involved structures: Then the grades of receipt and of nesting will be so better understood and the variabilities of reaction so well comprehended, that any wished-for amount and desired-for type of reaction-testing can be employed whenever wished.

VI. These special forms of tests are of value in the determination of the character of therapeutic measures. Contrary to the opinion that early cases of ocular tuberculosis cure themselves, they are of use in giving ideas as to the amounts, the degrees, the probable intervals, etc., of later necessary-to-be-employed drugs, remedial serums, etc.[1] In opposition to the

tected from direct infection in the same manner as is done to a greater degree in gonococcal cases. He has studied two consultation cases occurring in the persons of two over zealous fellow practitioners, who had used both the conjunctival and the cutaneous methods almost simultaneously upon themselves. Careful treatment by their attending physician, soon relieved the subjects from their self-imposed predicaments.

24. While many authorities state that the initial therapeutic dosages of tuberculin should be small in amount, and that they should be increased quite slowly in frequency over periods of several months to a year, yet tubercular treatment, to be of any definite value, must have as adjuvants, adequate control of the patient, proper food, and an abundance of fresh, pure air.

fact that excision of tuberculous areas of primary type is possible, yet, it is certain that most, if not all, tubercular affections of the eyeball must be usefully inoperable. In general, no tuberculin therapy or other form of dyscrasic treatment should be even thought of until one or several of the etiologic tests have satisfactorily determined the presence of a tubercular condition. While the dates and the degrees of tuberculin therapy, for example, whenever thought wise and well, after positive reactions to the tests have taken place, can be thus carefully estimated, yet it must not be forgotten that the mere trial of the tests in provoking positive local disturbance may interfere with the proper performance of subsequent tuberculin therapy, by reason of later induced recurrent exacerbations. In fact, all such reaction-tests must be considered in the light of therapeutic measures—the initial therapeutic dose as it were,—and no tuberculin therapy, no matter how distantly employed, should be administered until there is a surety that no harmful ocular reaction can be produced by the previous performance of the tests. In cases of marked lymphadenitis, especially in children with neighboring caseative and liquefactive necrosis expressions, the tests must be made with the greatest precautions, and if grossly positive—as they are apt to be in some such instances,—tuberculin therapy, unless carefully graded, will be found to be either dangerous or useless. The cutaneous method, if guardedly employed, may be of value for the determination whether the results of any recently administered therapeutic dosages are still in activity.

The employment of the test materials as immunizing agents in normal subjects, has not, as yet, according to some, proved of real clinical value: The immunization is said to be only relative. Possibly, the question may be answered with greater certainty by competent and repeated study of the lower faunal types made in different environments and under varying habitats.[25] On the contrary, the importance of the prophylactic power of the materials when judiciously employed for such purposes in infancy and in childhood, cannot be doubted. Multiple tests, particularly upon the same conjunctiva, in cases in which a primary reaction has been pronounced, or where the

25. Some work in this direction in regard to the eye, has been done with the crossed bovine and human forms, though as yet, rather vaguely, and too indeterminate for publication. Much progress, however, towards betterment of instrumentation, detail, etc., is at hand, and useful results are being both directly and indirectly gotten.

ocular tissues are coarsely involved, are to be deprecated as useless, by reason of temporary immunization—even without clinical expression—of the primarily tested parts, and as dangerous by an increased result—a true "anaphylaxis," or a quickened response (and allergism) produced by a continuance of the results of a previously induced reaction. [26] The value of the performance of simultaneous reactions—for example, mucous and cutaneous,—of the most minute and hence safest types,—are both dangerous and uncertain, and though, according to some observers, worthy of trial, are to be deprecated: No interpretation of results under such circumstances, becomes permissible.

Secondary tests should never be made upon the same conjunctiva, but in a few suitable cases, they may be done upon the fellow membrane after a proper interval of time. In some cases they can be safely and usefully accomplished cutaneously at a point as near the affected organ and its related lymph streams and vascular channels as is judiciously possible (for example, the corresponding uninvolved temporal, auricular or preauricular regions)[27]; leaving a period of several weeks between each testing. The presence of the bacillus in the blood of the subject in most of the systemic cases, can be coetaneously determined to advantage.

VII. These special forms of tests are of prognostic importance in regard to both the ocular tissues and their adnexa. Practically, it has been found by some, that the cutaneous test is the more-to-be-relied upon determinative. A positive test early obtained, as a properly or fairly good functioning eyeball saved as the result of appropriate treatment, is a triumph of diagnosis and therapy. Moreover, the production of positive test results and the relative increased degrees of reaction, are of favorable prognostic value, especially in measure, in cases in which there are coarse general expressions of the disease, as showing that the defensive agents of the organism are still usefully at work. Delayed reactions and negative results are often of indifferent value or of bad prognostic import.

26. By some, this period of interval may be considered as too long, but both empiricism and experiment have shown that it is not, particularly in the coarse and the delayed types of reaction. The cutaneous test, which is the one preferred by the author as the primary method in all ophthalmic cases, followed by the direct intravascular studies, is easy of performance, and, if properly done, is not dangerous to the integrity of the eyeball.

27. The preauricular or postauricular glands are not infrequently brought into prominent appearance by the tests.

VIII. These special forms of tests, when properly interpreted and considered in a negative way, are of use in the decision as to whether tuberculous affections of the eye and its adnexa are healed and cured, or that tubercular foci are so sealed as to be permanently latent. This is particularly true for the most dangerous of the tests—the conjunctival;—thus rendering this method, when judiciously performed, at times, of distinct usefulness. From what has been previously noted, it will be seen, that negative results are not certain in all instances; the error, in accordance with the best authorities, amounting to about ten to fifteen per cent.[28]

Negative reactions, in spite of the presence of pronounced cases of chronic ocular disease, are expressive of the want of protective influences, and are significant of bad prognosis for the eye and its related parts. The explanation of this, as previously shown, may be that an insufficient amount of an inefficient grade of autogenous tuberculin to produce sensitization in the test or suspected area, is elaborated in the lymph and the blood of the subject (a condition noted by some as a "negative phase" in the patient). A negative result which thus becomes of positive importance as regards both prognosis and therapy. The negation of the test may be also the result of some form of mixed endogenous infection with or without ectogenous complication.

28. As the methods, the technique, and the choice of subjects, become better understood, this margin of uncertainty must decrease.

REMARKS ON THE TUBERCULIN TREATMENT OF THE EYE.

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The treatment of tuberculous eye affections with tuberculin, which for a long time was not much thought of, has, within the last few years, gained renewed interest among ophthalmologists. In my paper in the Zeitschrift für Augenheilkunde, XXI, p. 427, (reviewed in Ophthalmology, October, 1909, p. 116), I discussed in detail the reasons for this and the views, entertained in Germany, on the curative value of tuberculin, the methods and prospects of tuberculin treatment, and I proposed changes in the now prevalent use of New Tuberculin, (T. R.). The experiences are still scanty, and the opinions of the few ophthalmologists, versed in this treatment, discrepant, but the results have been favorable. At the instance of the editor, I shall briefly sum up what is of interest to the ophthalmologist who has no opportunity to gather experiences of his own.

In spite of the great disappointment following the discovery of tuberculin by Robert Koch, a few physicians believed in its therapeutic value and searched for a suitable mode of application, especially A. von Hippel at Goettingen. Koch himself aimed to improve his remedy and, in the course of years, devised New Tuberculin and the Bacilli Emulsion. The views on the value of the recent preparations are still divided. Some physicians still employ the old tuberculin.

Old tuberculin contains as chief active principle the tuberculin toxin obtained from the tubercle bacilli. New Tuberculin and bacilli emulsion contain, besides tuberculosis toxin, the substances of dead and crushed tubercle bacilli.

Koch's intention was to create antitoxins by carefully introducing tubercle toxin into the body of the patient, and through introduction of dead, specially prepared, tubercle bacilli in the new preparations, to produce defensive substances against

the morbid agent itself, to "actively immunize" the patient, as the bacteriologists term it. Experience has shown, that active immunization of the human body against tuberculosis (= bacterial immunity against tuberculosis) cannot be achieved in man. But the habituation to the tuberculosis toxin is possible in a number of patients, and I believe there is no doubt that merely through this therapeutic effects are obtainable. Hence theoretically old tuberculin, which chiefly contains toxin, would seem to be the best. This, however, is not the case. Although it is useful, it frequently is not well tolerated from the following reasons: All tuberculins contain, besides the toxins, accessory substances unavoidable in their preparation, partly toxic substances from the culture soil of the bacteria, which greatly influence the tolerability of the remedy. The tolerability is also dependent upon many other conditions: The strength of the patient, the phasis of his disease, and others, which cannot be described in a few words. Even in the most cautious application it is difficult to say why a tuberculin is not well tolerated.

With any of Koch's tuberculins results may be obtained. It depends on the mode of administration and the right selection of patients, which is a matter of personal experience. The failures of the first few years were due to insufficient experience, and even now the correct application of tuberculin is an art which must be learned. There is no absolutely best tuberculin and there are no definite rules for its use. But there are some general principles which I shall briefly set forth.

Robert Koch originally demanded that in a tuberculin cure intense reactions, i. e., moderate fever and local reactions, viz.: alterations of tissue at the focus, be considered as favorable and desirable. This is still adhered to by a few pupils of Koch, especially in the treatment of the lungs and larynx with modern modifications of older directions, e. g., the "Etappenkur" by Professor Petruschky of Danzig, and not without results.

But this is by no means applicable to the treatment of the eye, in which peculiar conditions exist. All ophthalmologists, with experiences of their own, agree as far as I know, that only mild treatment is suitable for ocular affections which principally avoids any local reaction, especially at the focus. How sensitive the eye is towards tuberculin has been proven

by the Ophthalmo-reaction (Calmette, Wolff-Eisner), which must be discarded for diseased eyes.

For a mild tuberculin cure Koch's tuberculins may be used, but not with absolute safety on account of their irregular action. In my opinion the new tuberculin (T. R.) is the best.

A. von Hippel (von Graefe's Archiv. LIX and Transactions of the 32nd Congress of the Ophthalmological Society, Heidelberg, 1905), and his pupil Davids, (von Graefe's Archiv. LXIX), reported on a larger number of tuberculous eye cases successfully treated with new tuberculin. Nothing is to be said against these reports, and I am convinced that eyes were saved which without this treatment with tuberculin would have been lost. Therefore the treatment of tuberculous affections with new tuberculin, according to the directions of A. von Hippel, (they will be found in Axenfeld: Bacteriology in Ophthalmology, p. 314), which must be strictly followed, may be recommended, but it requires improvement.

The difficulties of tuberculin treatment for the practitioner are mainly these: After ascertaining the diagnosis, in doubtful cases with diagnostic injection of tuberculin, the treatment with tuberculin commences. But even under great precautions the new tuberculin occasionally is not tolerated, as it is not without danger. The physician and the patient easily became discouraged and discontinue the applications. A. von Hippel mentions such cases, which, however, do not amount to much in a large hospital, as the patients here generally submit to the further treatment, even if at first no results are noticeable.

The necessity of finding a method suitable for the practitioner who has not the facilities of a large hospital at his command, prompted me to try tuberculin of Béraneck, (procurable from Prof. Béraneck, Neufchatel, Switzerland), which has, for years, been successfully used by Prof. Sahli of Bern and Prof. Dautwitz of Coeln in the treatment of the lungs, but has not been used in ophthalmology. The advantage of this tuberculin, which is similar to Koch's preparations, is that it acts very mildly and may be prepared in solutions which admit of easy and harmless applications.

Its slow action is no disadvantage. All recent investigations, especially those of Wright on opsonins, show that the

idea to accelerate a cure by frequent and concentrated tuberculin injections, is erroneous. This will be understood if one considers that the object of the tuberculin injection is to introduce into the body of the patient a specific toxin in minimal doses and through this to stimulate the formation of large quantities of antitoxin, *i. e.,* to produce an immunity against the tuberculosis toxin. The organism must have time for a reaction. It is therefore appropriate to make only two injections per week. He who has not time nor patience for such a treatment, cannot be helped. As to this point physician and patient must have an understanding. In many cases tuberculin treatment is the only means to bring about a cure and must be tried.

A condition for any tuberculin treatment is, that it is at least harmless. This can in my opinion be promised for the tuberculin Béraneck. On account of its mild and harmless action it can be used without hesitation in early stages of tuberculosis. It will be readily conceived that its action is limited if the body is overcharged with toxin. Therefore the treatment must be commenced early.

The tuberculosis of the eye is not a primary tuberculosis, as formerly supposed, and cannot be radically cured by enucleation of the eye. Conservative and specific treatment with tuberculin must, for this reason, be tried. To the early tuberculous manifestations on the eye belong, as found by improved diagnostics, quite a number of diseases of the cornea and uvea of generally unfavorable course and of obscure etiology, (parenchymatous keratitis, serous uveitis), if not of syphilitic origin. As shown by experience, these can be successfully treated with tuberculin Béraneck, at a time at which other methods of treatment are still considered effectual.

Thus a new field for tuberculin treatment will be opened in ophthalmology, as soon as the principles for the method of treatment are established. The results so far obtained are favorable. The causes of failure in some cases, however, are not sufficiently elucidated. Not every case is fit for tuberculin treatment, which also has its limitations. Numerous practically important questions are still to be answered. My researches to that end are not yet completed. Owing to the nature of the tuberculous affections final results and conclu-

sions can only be reached after a long time. I am convinced that even now tuberculin is a very valuable remedy which in the future cannot be dispensed with.

It was my purpose to call attention to this and to stimulate others to researches. The directions how to use Tuberculin Béraneck will be found in my paper in *Zeitschrift für Augenheilkunde* and in that of Sahli, "Uber Tuberculinbehandlung," Basel, 1907. Familiarity with them is necessary for the understanding of the principles of the treatment, as only the knowledge of the experiences so far gained insures success.

I intend to report, in a second communication in Ophthalmology, more minutely, from further experiences, on the mode of treatment, particularly on the modifications necessary in ocular affections, if the interest for this kind of treatment of ocular tuberculosis will be aroused.

INJURY TO THE EYE FROM THE PRESENCE OF ANILIN PENCIL IN THE CONJUNCTIVAL CUL-DE-SAC.

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An injury to the eye from an indelible pencil is sufficiently rare and unique to justify a detailed report of a case which came under my observation in October, 1909.

Miss M., age 14, a pupil in the public school, while sharpening an indelible pencil broke off the point which flew into her right eye. Efforts at home to remove the offending particle from the eye having failed, the mother sought her family physician who referred the accident to me about an hour after it occurred.

On the first examination there existed the following conditions: marked swelling of the lids; some spasm of the orbicularis photophobia; profuse lachrymation, stained purple. In addition to these symptoms the tarsal and the bulbar conjunctiva were found to be edematous and completely stained a very deep purple; the cornea was steamy looking and the epithelium appeared lusterless, rough and slightly stained. The pencil point was seen to be partly buried in the swollen conjunctiva midway between the inner limbus of the cornea and the caruncle, below the horizontal meridian and lying in the lower cul-de-sac. Pain was severe, and vision was reduced to counting of fingers at ten feet. Under cocaine a piece of purplish anilin pencil, six mm. long, was removed with a pair of forceps. The edges of the wound were ragged, metallic looking and involved both tarsal and bulbar conjunctiva, the raw surfaces lying in juxtaposition to each other. With a cursory glance I believed that I was dealing with a perforated wound as the first view of the globe revealed the presence of a crescent of darkly stained fluid, one and a half mm. high, lying in the anterior chamber. This was so striking that it resembled an hyphemia. On more careful examination, however, the tension was found to be normal and it was determined that the wound involved the conjunctiva only. The aqueous was stained from the absorption of the anilin color which had gravitated to the bottom of the anterior cham-

ber. The upper edge of the colored aqueous was not as clearly defined as it is in an hyphemia, but faded rather gradually, the entire aqueous being tinted, slightly at the top and densely at the bottom.

So complete and so deep a stain of the entire eyeball gave the young girl a very gruesome appearance; and the mother was more solicitous in regard to the possibility of permanent disfigurement from the discoloration than in regard to the possible damage to her vision. Frankly, I did not know what to anticipate, but feared some permanent staining. My experience to the contrary in this case may prove of some value to others.

After removing the piece of pencil the eye was flushed with water for fifteen minutes, as long as I was able to remove any superficial stain; but after the irrigation there still remained some metallic looking, small, isolated islands of deep pigment in the lower cul-de-sac. No medication was used except that the cul-de-sac was filled with sterile petrolatum.

On the following day the chemosis was marked; the epithelium of the cornea had re-formed and was free from stain; the discoloration of the aqueous was still present and the hyphemic appearance was very marked. Vision remained the same as on the first day, fingers at ten feet.

On the third day the pain was more severe, shooting in character, and referred to the superorbital region. Atropine was therefore used. The necrotic tissue at the site of the foreign body was easily removed, leaving a clean conjunctival ulcer. Vision was 20/cc. Aqueous had cleared considerably.

On the fourth day the pain had nearly disappeared; the pupil dilated about two-thirds and ovally; the aqueous was much clearer; the conjunctiva was still deeply infiltrated with purple; the cornea was slightly steamy, and the lower lid had become fastened to the globe. The adhesion was easily broken up with a probe, the lid and globe separated. Petrolatum was used and atropine instilled.

From this time on the absorption of the coloring matter was rapid and by the ninth day no trace of color was seen either in the anterior chamber or in the conjunctiva. Vision had improved to 20/xl and there was no discomfort complained of. The cornea was still hazy and, as the aqueous appeared muddy, there was probably a slight uveitis, ciliary and conjunctival injection also being present. The adhesions to the globe were broken up each day for several days. By the end

of the second week all symptoms and signs had completely disappeared except a little redness. There was no symblepharon and the vision was now 20/xx.

A short review of a few of the reported cases will best show the varied experiences of others.

A. Vogt[1] who experimented on rabbits' eyes, presents two papers on the detrimental influence of artificial anilin. He finds that the severity of the conjunctival inflammation depends on the chemical nature of the anilin. "The application of 5 or 10 milligrams of the acid, neutral or mordant colors, produces little or no inflammation. The same is true of colors not soluble in water. The introduction of an equal quantity of one of these basic colors produces violent inflammation and may produce panophthalmitis." (Abstract of Vogt's paper in the *Ophthalmic Year Book,* vol. iv, p. 126.)

E. Bock[2] extracted a piece of solid anilin coloring matter (gentian violet) from the cornea. It caused very little irritation. The conjunctiva was only slightly stained and the cornea not at all. All coloring disappeared within a day.

Ray, J. M.[3] reports two cases. The first, a girl of 15, got a piece of anilin pencil in the lower cul-de-sac. Three days later, when she was first seen, the skin of the lid was stained a bluish color. The conjunctiva was deeply stained and the epithelium of the cornea was colored blue. All of the pencil was not removed until the tenth day. An ulcer of the cornea and of the conjunctiva developed, and later a symblepharon and a pseudo-pterygium formed. In the second case a small piece of the indelible pencil was lodged in the cornea which became discolored about the area of the abrasion. Ray mentions that the stain is slowly fading, but does not state whether or not there was any permanent staining. One month after the accident there was still some stain.

Three other reports of cases were found in the literature at hand. Natanson[4] reports two cases. There was slight staining and irritation of the cornea and of the conjunctiva which disappeared in the course of a few days. Bray[5] reports a case in which both the bulbar and the tarsal conjunctiva were discolored and the discoloration entirely disappeared in eight hours. Tyson[6], in a report of a case in which there was con-

1. Arch. f. Opht. Apr., 1906. ztsch f. Augenh., Jan., 1906. Centralbl. f. prakt. Augenh., April, 1904
3. Ophth. Rec. Jan., 1905.
4. Ophthalmoscope, Nov. 1904
5. New York Med. Jour. Jan. 7, 1899.
6. Knapp's Arch. Vol. xxx, No. 1, p. 77

siderable irritation describes an unusual condition, "A pigmented hypopyon of a greenish brown, metallic lustre."

From a study of these reviews it will be seen that the discoloration may last from a few hours to several weeks. I found no report of any permanent staining. The irritation may be slight and insignificant or may be severe enough to produce hypopyon or even panophthalmitis. The complication of symblepharon and pseudo-pterygium, which in Ray's case followed where the anilin remained in the eye for ten days, well illustrates the necessity for removing all of the caustic material immediately and thoroughly.

The indelible pencils are composed, for the most part, of graphite, gum, clay, and of various forms of anilin coloring matter. The chemical properties of the anilin vary considerably. And the amount of damage to an eye depends largely on its chemical nature; whether acid, basic, or mordant, and on its solubility, as was pointed out by the studies of Vogt. The basic and soluble anilin colors are the most irritable and produce the greatest amount of inflammation.

In my case the anilin acted as a caustic. The conjunctival wound had all the appearance of a burn and came away on the third day as a slough, leaving a conjunctival ulcer.

Treatment. Vogt,[1] in his experimental work on rabbits, found that the action of most anilin colors may totally or to a great extent be neutralized by irrigations of a 10% solution of tannic acid; and he concludes that solutions of boric acid, bichloride, sodium chloride, bicarbonate of soda or irrigations with water, do more harm than good.

Peroxide of hydrogen has been used as a decolorizing agent and by some it was believed to have done good. No decolorizing agent was used in my case and all stain, aqueous, corneal, and conjunctival, had completely disappeared in eight days.

In the case which we report water was used freely at the first visit to wash away all the particles of the anilin that had not penetrated the tissue. And under cocaine much of the necrotic tissue was removed with forceps. I do not believe that the water did any harm and I am convinced that the proper thing to do is to get rid of all of the caustic material as soon as possible and as thoroughly as possible. In order to prevent symblepharon a salve is also indicated, especially when both the tarsal and the bulbar conjunctiva are destroyed. Ad-

hesions between the lid and the globe should be broken up daily, and should this not succeed a conjunctival flap operation would be indicated, placing the tissue so as to fill in the denuded surface, in order to keep the raw surfaces apart.

Atropine would be indicated where there are symptoms of iritis or cyclitis which are likely to develop from the absorption of the irritating anilin.

Conclusions. Anilin, which is one of the ingredients of colored indelible pencils, is often an eschorotic and an irritant. The insoluble and the acid anilin causes little harm, while the basic and the soluble anilin may produce considerable sloughing and severe inflammation. Experimentally it has caused panophthalmitis.

A 5 or 10% solution of tannic acid should be used to neutralize the effects of the anilin. Hydrogen peroxide may be used as a decolorizing agent.

Even a very extensive staining of all tissues, conjunctiva, cornea, and aqueous, will be completely absorbed in a few days.

The case herewith reported is unique in that it had the aqueous stained.

53 South Fitzhugh St.

TRANSFIXION OF CORNEA BY HAT PIN WITHOUT INJURY TO LENS.

By Arthur G. Bennett, M. D.,

BUFFALO.

M. K., 28 years old, consulted me Oct. 17, '09, with an injured eye, giving the following history:

The previous day, being surprised by a sudden shower, wearing a new hat, naturally her first thought was for the safety of her headgear, using her right hand she removed one hatpin, and retaining this reached for a second one and drove the first one completely through the cornea of the left eye, transfixing it. She was attended by her family physician, Dr. Jack, of Depew, who realizing the seriousness of her condi-

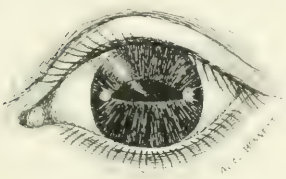

Fig 1

Fig 2

tion, referred her to me. I found the anterior chamber empty, the pupil horizontally oblong and two wounds in the cornea about two millimeters from the limbus about the horizontal meridian, the iris prolapsed into each wound. Figure 1 represents the condition when first seen. I immediately put the eye under the influence of atropine and in about 30 minutes the pupil had dilated vertically but not horizontally, the synechiae not giving way (Fig. 2). The lens was apparently not injured. Atropine, gr. iv to the ounce of water, was prescribed and the patient was instructed to return the next day.

Oct. 18, on her return, the anterior chamber had reformed and the external synechia had pulled away. Treatment continued.

Oct. 19, the internal synechia gave way and the pupil is now round. Upon examination the lens is found to be intact

and a perfect view of the fundus obtained, the tension normal.

The remarkable fact that with a comparatively blunt instrument as a hatpin the cornea could be transfixed from the nasal side without injuring the lens and that after prolapse of the iris on both sides it should be freed without operation, renders this case worthy of being placed on record.

PRELIMINARY NOTE ON INCREASED INTRA-OCULAR TENSION MET WITH IN CASES OF EPIDEMIC DROPSY.

By F. P. Maynard, M. B., F. R. C. S., D. P. H.
Lt.-Col., I. M. S.,
CALCUTTA.

In no account of epidemic dropsy that is available have I seen mention made of a rise in intra-ocular tension being met with in the disease. Yet during the last eight months I have come across more than twenty cases showing this complication. In some recovery has occurred with or without a relapse, in some of the cases deep cupping has followed with almost complete blindness from atrophy. In the rest the time they have been under observation is too short to be sure what the final outcome will be. The importance of the recognition of the complication is so great that it seems advisable to publish this preliminary note, so that others may also be on the lookout to diagnose and treat it and to help in elucidating its pathology.

In a family where epidemic dropsy breaks out and numerous members are attacked with dropsy, fever and cardiac troubles, it may be found that some of those attacked complain of dimness of vision. On examining them one usually finds the cornea a little steamy, the anterior chamber normal or deep, the pupil small or moderately dilated and acting but sluggishly to light; there is sometimes complaint of pain, but rarely is there any injection of the vessels. The tension of the eyeball is usually distinctly increased; sometimes it is normal and in one case it was diminished. Halos—generally rainbow-like—are spontaneously complained of. Among those not complaining of dimness of vision it will often be found that they have had halos at sometime or another during the attack of dropsy. These halos are sometimes seen early in the morning, but more often later in the day and lasting only a few hours, sometimes recurring again in the evening. They are not due to conjunctival secretion. Usually the failure of vision follows the dropsy, but in some cases it is noticed at the same time, and in two cases it preceded the dropsical signs

by a short interval. Such patients complain much of the sight becoming very foggy after looking at near objects. Two-thirds of the cases showed pathological cupping of the disc from 2 to 6 D. in depth—a few showed only physiological cupping, though usually of considerable extent, and a few showed no cupping at all. The retinal veins are usually engorged, and both they *and* the arteries showed marked pressure-pulsation in several cases. Priestly Smith's scotometer frequently gave negative results, Bjerrum's sign being absent. The fields were generally contracted especially at the nasal side. In none was the eyeball enlarged. None had K. P. or signs of iritis past or present. None of the patients had markedly small corneæ. Two were myopes. Two-thirds were men and one-third women. The ages of all except two were under 36. Eight were under 28 and there was no family history of glaucoma forthcoming.

The questions naturally arise as to whether these cases are really glaucoma, and if they are, or whatever they are, are they due to epidemic dropsy? That they are directly due to that disease is rendered probable by their numbers and by the ages at which they have been met with. A case now and then of ordinary chronic glaucoma occurring in a subject of epidemic dropsy would not prove anything, even if two or three occurred in the same family, for nothing is commoner than to find more than one mmeber of a family attacked by chronic glaucoma. It is of the ordinary type, however, and is usually met with in elderly subjects.

When we find cases of unusual type—varying from cloudiness of the cornea with halos and slight increase of tension, up to almost complete blindness with marked increase of tension, deep cupping, etc. (still of unusual type, however—as regards anterior chamber, pupil and injection)—occurring in young people who are the subjects of, or recovering from, epidemic dropsy, we cannot refuse to regard the latter disease as being the cause of the former. The fact that some of the classical signs of glaucoma were absent does not prove much. It rather confirms the view that the disease really is true glaucoma. For we know that in buphthalmus or glaucoma in young subjects, such as most of those patients were, the pupil is rarely dilated, the anterior chamber is never shallow, and the tension is not always much increased. The grosser signs of buphthalmus, vis., enlarged globe, displacement of the lens and

irido-donesis, would not be found in cases that had lasted so short a time as these.

Supposing that the disease is glaucoma due to epidemic dropsy how does the increased tension come about? Rise of intra-ocular tension must be due either to increased formation of lymph or to diminished outflow. Both conditions may be present. In the cases now described evidence of diminished outflow is incomplete. The anterior chamber is not shallow and the filtration angle *appears* open while the ciliary veins are not enlarged. There were no signs in any cases of inflammation of the uveal tract, so that this may be excluded as the cause. Having regard to the cardio-vascular phenomena met with in epidemic dropsy it seems reasonable to attribute the ocular symptoms to a passive-congestion of the uveal tract leading to increased production of lymph. These cases tend to prove A. Terson's view that glaucoma may in some cases be nothing more than œdema in a closed cavity. Extensive observations on the blood pressure in epidemic dropsy are wanting, but in several of these cases it was taken by Martin's modification of Riva-Rocci's sphygaromanometer and proved to be low as indeed one's pulse examinations had led one to expect. In the few in which it was high the patients were elderly, and the certainty of the connection between the rise in tension and the dropsy was less certain. One explanation may be, therefore, that there is a passive œdema and transudation of lymph into the eyeball, setting up increase of tension with all its consequences. This transudation would be the more effective if the lymph secreted or filtered off were of a more colloid nature than the ocular lymph usually is. The excretion through the folds of the pectinate ligament into the canal of Schlemm would be interfered with thereby and tension more easily raised. There is no evidence, I believe, as yet to show what the lymph or serum composition or blood coagulation time is in epidemic dropsy. Again the question arises could the increased secretion and possibly altered composition of intra-ocular lymph be due to irritation of secretory nerves in the eyeball? This takes us back to Donders' explanation of glaucoma and considering the strong views held by many as to the identity of epidemic dropsy and beri-beri (a disease in which the nerves are markedly attacked by the poison), it is a question that should be taken into account.

GEORGE CUVIER HARLAN, M. D.

George Cuvier Harlan, M. D., who was one of Philadelphia's distinguished ophthalmic surgeons, died Sept. 25th, 1909, from injuries received in falling from his horse on September 22d, 1909. He went for a ride about dusk and when his horse slipped on a pebble on Wissahickon bridle path, he was thrown against the side of a gully and lay there for three hours before he was discovered by a groom. Upon being removed to the Chestnut Hill Hospital he was found to have sustained a fracture of the spine.

Dr. Harlan, son of Dr. Richard Harlan, was born in Philadelphia on the 28th of January, 1835. He received his degree of B. A. from Delaware College in 1855, and his Master's degree in 1858; he was graduated from the Medical Department of the University of Pennsylvania in 1858. He became Resident Physician of the Wills' Eye Hospital in 1857; was surgeon to that institution from 1861 to 1864, and from 1868 until 1885. From that date until the time of his death he was a Consulting Surgeon to the Hospital. He was Assistant Surgeon in the Navy and later Surgeon of the Eighth Pennsylvania Volunteer Cavalry in the Civil War. He was a member of the American Medical Association; a member and once President of the American Ophthalmological Society and Philadelphia College of Physicians; ophthalmologist to the Pennsylvania Hospital and Pennsylvania Institute for the Blind and Pennsylvania Institute for the Deaf and Dumb; emeritus professor of diseases of the eye in the Philadelphia Polyclinic, and was chief of the ophthalmologic section at the Louisiana Purchase Exposition, St. Louis, Mo.

In the death of Dr. Harlan, Philadelphia has lost one of its leading ophthalmologists and greatest surgeons. His constant aim was to raise the standard of ophthalmology and in his teaching he was always clear and practical.

He will long be remembered as the originator of an operation for symblepharon, and of a test for malingering. His articles upon "Diseases of the Eyelids" and "Operations performed upon the Eyelids," are exceedingly valuable and a small work, "Eyesight and how to care for it," was for many years popular amongst the laity.

L. Webster Fox.

Abstracts From Recent Ophthalmic Literature

AMBLYOPIA AND BLINDNESS.

The Relief of Eye Disease in Egypt.—MacCallan, A. F., Egypt (*The Lancet*, Sept. 18, 1909). This paper considers mainly the incidence of blindness and trachoma. The writer divides the clinical variety of trachoma in Egypt into four stages based on the comparative prominence of the three features of the disease—granulations, papillary hypertrophy, and connective-tissue formation. The universality of trachoma in Egypt is instanced by the high percentage of pupils in the Government primary schools affected with the disease, 96 per cent. at one of them. According to the census of 1907, half a million persons were enumerated as blind in one or both eyes; this figure is probably a quarter of a million short of the actual number. It has been suggested that ophthalmic conditions have enormously improved in Egypt during the last twenty years, but no explanation has been offered for this phenomenon, which is probably as yet unrealised, the extraordinary density of the population militating against hygienic progress. The generosity of an Englishman enabled the Egyptian Government to equip and maintain two travelling hospitals which were originally organized six years ago by Mr. MacCallan. In addition to these, he has the direction of three permanent hospitals in different provinces, recently built partly by charitable effort and partly by the Government. Mr. MacCallan travels from one to another of these hospitals, of which he is director, and at which he gives clinical instruction to Egyptian surgeons who have obtained their diplomas at the Medical School. The surgical staff of all the hospitals is composed of surgeons thus trained. C. H. M.

Has Monocular Vision an Injurious Effect Upon the Eye. Clausnitzer (*Wiener Medizinische Wochenschrift*, Aug. 28, 1909).

There are many who believe, that after the loss of one eye, the second eye suffers from overwork. The writer in looking over the records of 1,300 patients who lost one eye, by enuclea-

tion or became amaurotic on one eye found, tracing some cases as far back as 44 years, that diminution in vision in the good eye did not take place. J. G.

ANATOMY.

The Development of the Plica and the Caruncle in Man.—Contino, Palermo (*Graefe's Arch.*, LXXI. H. 1, July, 1909). This investigator's conclusions are drawn from a study of 18 embryos and 9 foeti (between 60 days and birth). In every instance the inner angle and the adnexa were reconstructed by the plastic method, which proved especially fruitful in unexpected results. At the tenth week no differentiation can be made of the changes at the inner lid angle and the corresponding commissure besides those which precede the union of the lid borders. When this takes place there is noted behind the inner commissure the presence of a crescentic fold which arises from the inner end of the fornices and extends further into the inferior fornix. It is placed with its concave border up and out. Thus the plica semilunaris cannot possibly act as a mechanical hinderance to the union of the lids. This fold retains in its further development the same arrangement as above described and is identical with the nictitating membrane in mammals. In the first 12 days after its appearance it develops rapidly, spreading into the fornicles and increasing in thickness. On the 85th day of embryo life it changes its structure, which presents the evidences of active mesodermal elements. The mesoderm becomes fibrilla and the free margin of the fold through a localized increase in the breadth of the middle portion presents a prominence flanked by two indentations. From now on the plica expands with the growth of the o. vesicle, but its thickness remains unchanged. At birth it appears as a slight vertical fold of conjunctiva. Through further growth of the eyeball and the abductive movements of the globe it stretches so that in the adult only a small part of the middle retains its original form of a conjunctival fold and a cul de sac cannot always be found behind it. On the third day of its beginning there appears on the anterior surface a thickening of the ectoderm which presses into the mesoderm. Later the same occurs in the fornix. This is manifested as a group of small cellular elements with deeply stained nuclei,

representing the beginning of the cartillage. In the 12th week the cartillage of the plica and fornix are differentiated. Later the cartillage loses its club shape and becomes more cylindrical. The failure of further development of the ends of the club show that it has passed its period of growth and from now on its increase in diameter parallels the growth of the semilunar fold. The cartilage of the fornix continues to grow and shows in its added portion a bright streak indicating the formation of glandular lumen. Kraus' glands develops later than those of Ciaccio and only between the fourth and fifth month of intrauterine life show secondary branching. By the eighth month Kraus' glands, aside from their proportions, are as in the adult.

The caruncle starts a few days after the plica, as soon as the lids are fully separated. It begins on the 73rd day as a compact ectodermic excresence. Two portions can be differentiated: an upper, directed forwards; the other downwards against the fornix. On the 76th day a bundle of the orbicularis is pushed into the stroma of the caruncle. The upper portion of the caruncle, which is united to the upper lid, begins to separate through the destruction of the intermediary layer of cells. About the fourth day the caruncle begins to isolate itself from the lid border, a furrow forming at its base. By the fifth day the separation is complete. Now on the most prominent portion of its surface a button like thickening occurs which becomes the seat of the hair follicles. The number increases until the fifth month. The sebaceous glands in connection with the hair follicles have reached considerable size by the sixth month.

W. Z.

Further Contribution on the Anatomy of Preretinal Hemorrhages with Observations Upon the Limiting Membrane between the Retina and the Vitreous Body.—v. Benedek. Vienna (*Graefe's Arch.*, April 13, 1909). In normal conditions the terminals of the radial fibres are attached to the internal limiting membrane and this to the limiting membrane of the vitreous in such a way that these structures are separable without the interposition of pathological processes, and preretinal hemorrhage before and behind the limitans can take place in otherwise healthy eyes. The internal limiting membrane is an integral part of the retina and gives to it the characteristic sharp margin of its inner surface. Considered in

this light the majority of the hemorrhages under consideration —those lying behind the limitans—may be described as intraretinal or to use Elsnig's term, "marginal"; still the term "preretinal" may be used if one bears in mind the anatomical conditions.

That these hemorrhages occur more frequently in the macula lutea signifies that in this locality the limitans is less firmly attached to Müller's fibres. The round form of the peripherly lying preretinal hemorrhages, which are by no means rare, are to be explained by the property of fluids to spread in a circular manner, especially if there is uniform resistance. Disease processes may increase the disposition to the occurrence of preretinal hemorrhages as illustrated in one of the author's cases where there was separation of the limitans through exudate.

The author can arrive at no definite conclusion as to the source of the blood. The crested circular retinal elevations bespeak an arterial origin, as mechanically they would appear to be the result of force—in any event, the hemorrhage occurs per rhexin and not per diapedesin. The effusion between the limitans and the vitreous limiting membrane, where no injury to the former is the cause, can only arise from the papilla n. optici or from the anterior segment of the globe.

The mechanical conditions present in the massive sharply defined hematoma between the nerve fibre layer and the internal limiting membrane are: from a vessel of one of the retinal layers a hemorrhage occurs and the blood at first is effused between the bundles of nerve fibres and between these and Müller's fibres and only when the hemorrhage is severe is the membrane limitans internal torn from the radial fibres. Only when the pressure in the hematoma, which is determined by the strength and elasticity of the involved tissues, int. limit., etc., and the intraocular pressure equals the pressure of the exuding blood, or when the blood becomes coagulated does the hemorrhage cease. Between retinal hemorrhages without separation of the internal limiting membrane and preretinal hemorrhages, no distinct difference exists—the quantity of blood and the high pressure of the blood causes the separation of the limitans and gives rise to hematoma with sharply defined borders, not intercepted by tissue elements and with relatively

smooth walls limited by the space between the limitans interna and the nerve fibre layer. Transitional forms between these two forms of retinal hemorrhages are naturally possible and as daily experience demonstrates, very frequent. W. Z.

ANOMALIES.

Further Examples of Retinal Anomalies in Otherwise Normal Human Fetal Eyes.—Seefelder, Leipzig (*Graefe's Arch.*, LXXI, H. 1, July, 1909), reports another instance where the retina formed a sharp reduplication in a circumscribed area in the vicinity of the ora serrata in which principally the inner granular layer was concerned. The outer showed a slight fold in the inner layer. A portion of the cells grew outwards, causing a slight breaking through of the membrana limitans externa. Nearly all of the cells had long rod-like nuclei, as a result of which the cells which formed the rosettes in the surface of the retina took a decided epithelial form and arrangement. As to the meaning of these rod-like nuclei it is to be recalled that in foetal eyes of this period are richer in these elements in the vicinity of the ora than at the papilla. In this case the reduplicature was at the boundary between the least differentiated part of the retina and the papillary zone. These nuclei are properly considered as belonging to the Müller radial fibres.

In the same eye near the duplicature, there was an area in which the retinal layers were jumbled and penetrated by small and large, round and oval nuclei coming from both granular layers. In the midst of this was a small cyst lined with a simple layer of epithelial cells. Within the cyst were red blood corpuscles and cells of the appearance of vitreous cells. The peculiarity of this case lies in the fact that these anomalies were demonstrated in the two eyes of the same foetus. This supports the previously expressed view of the author that these anomalies may be seat of glioma; as glioma occasionally occurs in both eyes.

In the second case there was considerable development of the unpigmented cells of the pars coeca of the retina and to a much less extent of the pigment epithelium. From the tumor like growth were two long streaks of epithelium extending to the inner surface of the retina separated by a cleft which in

several places were agglutinated and attached to the retina. As a result of this spaces were formed around which the epithelium was arranged as a circle or arc giving a resemblance to "rosettes." Posterior to this a small section of the retina showed a high degree of degeneration; there were many vessels filled with blood. As a result of this stasis, hemorrhages were present in the anterior segment of the retina and in the vitrous. The vessels were so numerous that there was the appearance of an angioma. The author believes that these conditions arose from a proliferation of the pars ciliaris through the union of this and the retina at the ora serrata.

There are two seats of predeliction for the occurrence of retinal anomalies, namely, the optic nerve entrance and the ora serrata.

The first the author explains through the possibility of a thrusting aside of conglomerate cells of the retina by the ingrowing optic nerve fibres into the optic stem. Possible the late closure of the cleft may play a part. As to the periphery, it is probably due to the complicated mode of development of this region as described by Fuchs. W. Z.

BACTERIOLOGY.

Conjunctivitis and Purulent Inflammation of the Excretory Ducts of Meibomian Glands, Caused by an Encapsulated Gramnegative Diplobacillus. Landman. O., Toledo, Ohio (*Arch. Ophthal.*, July, 1909, XXXVIII, 374), describes a case of muco purulent conjunctivitis with involvement of the ducts of the meibomian glands. The case was treated for one month, with silver nitrate 2%, and sulphate of zinc, without relief.

Smears made from the conjunctival discharge and from the ducts of the meibomian glands showed a gram-negative diplobacillus surrounded by a capsule. The bacilli were fairly thick, large, rounded ends, with a pronounced capsule. The average length was 3.04 u. and with .96 u.

As a result of laboratory experiments, a weak solution of acetic acid was prescribed, and a cure resulted.

The morphology, staining properties, cultural growths, inoculation experiments, etc., are given. W. R. M.

Contribution to the Knowledge of Mild Hematogenous Inflammations of the Human Eye from Infection with Streptococci.—Schuessele, W., Baden-Baden (*Klin. Monat. für Augenheilkunde* XLVII, 11, Juli, 1909, p. 50). A man, aged 10, was laid up for 4 months with acute articular rheumatism following an attack of tonsillitis. Three years later endocarditis developed, which was ascribed to streptococcus viridis found in the blood, and the patient died from septicemia. About 3 months before his death both eyes became injected and the diagnosis of rheumatic scleritis and iritis was made. Then subconjunctival hemorrhages occurred, also small hemorrhages and white round patches in the retinae, hyphema and finally iridocyclitis, with pupillary membranes in right eye.

The affections of the uveal tract and the retina undoubtedly were due to bacterial embolisms. It was a rare case of marked chronic streptococci septicemia, which produced in the eyes mild endogenous inflammations as benign metastases.

The author considers such cases of great importance for the etiology of non-suppurative, frequently called "rheumatic," intraocular inflammations, especially of the iris and ciliary body, as they render it most probable, that they chiefly depend on bacterial localization and are not simply toxic, excepting perhaps the mere gouty, or similar, forms, in which from our present knowledge a chemical origin cannot be denied. Thus we may easily imagine, that very slight infections of the blood, as they undoubtedly occur much more frequently than generally supposed, from the tonsils and other points which even need not present the aspect of septicopyemia, may become isolately localized on the eye and create the impression of "rheumatic," etc., iritis in otherwise apparently healthy persons. C. Z.

CATARACT.

Concerning the Etiology of Senile Cataract. Lukens, Charles, Toledo, O. (*Ohio State Medical Journal*, October 15, 1909). After considering the histological structure of the lens, many causes which may disturb its nutrition are mentioned. "Becker and Deutschmann consider the cause of senile cataract to be an unequal sclerosis of the older lens fibres, while Schön attributes it to excessive accommodative effort, which throws the capsule into small wrinkles near the

equator of the lens, leading to a proliferation of epithelium in this region. Peters considers a cramp of the ciliary muscle responsible for an irregular supply of nutrient lymph, to be followed by a shrinking of the nucleus. Juvenile cataract, as a sequel of convulsions, is offered as contributory evidence to this hypothesis. Leber discredits this theory." Albuminiria and opacity of the lens are not often associated; but one per cent. of cataracts show glycosuria. Green considers angiosclerosis and cataract as closely associated, with which Jackson disagrees. Römer considers cytotoxins as causative of senile cataract, but Rigorbert questions whether it is a true cytotoxin or a chemical, such as uric acid. Risley's theory of the dependence of senile cataracts upon retino-choroidal disturbances is discussed. One conclusion is that asthenopia, clinically is responsible for many of these uveal disturbances, consequently measures which will relieve asthenopia, e. g., careful refraction, alteratives, sedatives and hygienic means, are prophylactic to cataract.

M. D. S.

Extraction of the Lens in its Capsule—or "Intracapsular Expression of the Lens." Stuart, C. C., Cleveland (*Cleveland Medical Journal*, August. 1909). The history of this operation is traced, Smith's original method described, and modifications by other operators, mentioned. The author says no American journal of ophthalmology mentions the work of Smith until the fall of 1905, five years after its publication. He reports two cases of attempted extraction in the capsule, the second of which was quite successful. The advantages and disadvantages of the operation are discussed but the writer concludes that the manipulative technic required to give continuous successes puts it beyond the bounds of safe work for many American operators. M. D. S.

The Smith Operation for Cataract.—Greene, D. W., Dayton, O. (*Jour. Ophthal. and Oto-Laryng.*, July, 1909, iii, 257), discusses the advantages and disadvantages of the Smith operation for extraction of the lens in its capsule. Among the advantages of the Smith operation he refers to the complete removal of the lens and avoidance of secondary operations; to the obtaining of the highest visual acuity of which the patient is capable; to the lessened danger of inflammatory com-

plications; and to the removal of immature cataracts. He mentions greater liability to loss of vitreous as the chief disadvantage of the operation. Greene believes that, other things being equal, the Smith operation is just as suitable for cataract as the older operations. W. R. M.

A Corneo-Conjunctival Bridge: A New Method of Cataract Extraction.—Cluckie, Nevin Gordon, Greenock, Scotland (*The Lancet,* Oct. 9, 1909). The writer describes a modification of the usual method of extraction of cataract which has given him the best possible results in all cases. The modification consists in performing von Graefe's operation up to a point that leaves a connecting flap between the cornea and the conjunctiva about four millimeters broad. Instead, then, of completing the corneal section in the usual fashion, the Graefe knife is carried further up under the bulbar conjunctiva for from 10 to 12 millimeters and is then withdrawn without cutting through the conjunctiva. We thus have a corneo-conjunctival bridge, which may be broad or narrow, but the broader and longer the conjunctival attachment to the cornea, the greater the chances of success and speedy recovery. The object in having a large cornea-conjunctival band is to allow of sufficient bulging and gaping of the wound to take place, so that when pressure is applied by a Daviel's spoon on the lower part of the cornea the wound opens sufficient to allow of the exit of the lens and to close immediately pressure is withdrawn. If the surgeon desires to perform iridectomy at this stage it is best done upwards and inwards; the capsule of the lens may be ruptured either before or after the iridectomy from the temporal side. By these means the operator will feel that he has complete command of the eye, no matter how nervous or restless his patient may be. Should there be any difficulty in the extraction of the lens by this corneo-conjunctival bridge method, the operator can complete his section, as in the ordinary von Graefe's operation, by the aid of a pair of fine scissors.

The writer claims the following advantages for this cornea-conjunctival bridge: less interference with the nourishment of the cornea; more rapid apposition of the parts, thus forming rapid and certain union; impossibility of the upper eyelid getting between the lips of the wound during the operation,

or the conjunctival flap turning in upon itself and being caught in the wound; less liability of iris, vitreous or cortex being held in the wound and of the frequent prolapses ensuing as a result of sickness; less corneal astigmatism. C. H. M.

A New Method for Detaching the Cataract in its Capsule.—G. C. Savage, M. D., Nashville, Tenn. (*Jour. Am. Med. Assn.*, Oct. 9, 1909). The following is a description of the instrument:

The instrument terminates at each end in a double curve, the one in line with the handle, and the other at right angles to this line. The point of bending is the point of union of the two curves. The two curves are to have the same radius as has the anterior surface of the lens, and the curves are to be 5, 6, and 7 m. m. long, for the reason that eyes vary in size. The name will be the "cataract-in-capsule detacher." It is a right- and left-hand instrument.

The following is to be the method pursued:

A. Patient, instruments, operator and assistant are to be thoroughly prepared.

B. Complete local anesthesia is to be used.

C. Lids are to be separated by a stop-speculum, or the upper lid held up by the assistant, with lid elevator, while the lower lid is pulled down by the other hand of the assistant.

D. The operator fixes the eye-ball by *grasping the tendon of the internus;* then with the other hand he makes the corneal incision of the usual size (5/xi of the circumference), associating with it a good conjunctival flap.

E. If an iridectomy is to be done, the one hand continues to fix the globe, while with his other hand the operator seizes the iris with iris forceps and gently draws it out through the incision just far enough to enable an assistant to make a vertical snip of the iris with iris scissors, close to the tip of the forceps. The ideal operation is without iridectomy.

F. The iridectomy having been done—or if the iridectomy is not to be done—the operator, still continuing to fix the eye with his grasp of the tendon, takes in his other hand the cataract in capsule detacher and, passing it into the anterior chamber, he directs the free point of the horizontal curve between the iris and the anterior capsule, pressing it gently downward until both the horizontal and the vertical curves are be-

hind the iris, or between the iris and the cataract; and now the detacher is to be so held that the horizontal curve shall rest on the lens below, but parallel with, the horizontal meridian of the lens, while the vertical curve shall rest on the lens to the outer side of, but parallel with, the vertical meridian of the lens, half way between the center and the margin. This is the primary position of the detacher.

On two movements of the detacher depends the success of the operation:

1. The vertical curve is made to press against the lens in such a way as to rotate it on its vertical axis, causing the outer margin of the cataract to move backward while the inner margin is made to advance to the same extent. The effect of the movement of the detacher is to tear loose the ligament laterally, the tear including much more than two quadrants, leaving untorn, probably, only a few fibres directly above and below. Now the instrument must be returned to the primary position, thus replacing the cataract in its normal position.

2. The horizontal curve of the detacher must not be made to rotate the cataract on its transverse axis by advancing the free end of the instrument while making *gentle* pressure against the cataract below its centre. The effect is to make the lower margin of the cataract recede while the upper margin advances accordingly. This motion tears loose the few remaining fibres of the ligament, above and below, making easy the next step.

3. The cataract in its capsule having been torn loose by the two movements of the detacher outlined in 1 and 2 above, this instrument should be withdrawn from the eye, and the cataract in the capsule should be delivered by external pressure, in the old-time way, often without any counter-pressure, the globe still being held by means of the tendon grasp. Occasionally light external pressure will show that some of the ligaments remain intact, as in one of my eight cases. In such a case the fixation forceps should be laid aside that the left hand may make counter-pressure with the shank of the cystotome until the cataract in the capsule presents in the corneal incision. At this moment the counter pressure should cease and the presenting cataract should be transfixed from behind with the point of the cystotome, by means of which the cataract

may be lifted out, thus minimizing the amount of further external pressure on the lower part of the cornea.

By this method of continued fixation, detaching and delivering, the operation is simple, easy and safe, and the trauma is very slight. Subsequent irritation was practically nil in all of my eight cases.

The after-treatment is the simplest, varying from the usual in that I leave the eye open behind a gauze flap after the second day.

What is new in this operation can be recognized easily by the reader, but I will summarize the points: (1) Method of fixation; (2) the detacher and the method of using it; (3) the transfixing of the lens from behind in cases requiring much external pressure. A. M. MacW.

Methods of Cataract Extraction.—Parsons, in *The London Medical Lancet* (*Abs. Charlotte Med. Journ.*, July, 1909), enumerates the chief advantages and disadvantages for simple and combined cataract extractions. The chief advantages of simple extraction are: Simplicity of the operation, including especially minimum of mutilation, of instruments required, and of instruments introduced into the interior of the eye; optical advantages of a round pupil—minimal dazzling, best visual acuity, and best field; cosmetic advantage of a round pupil; ease of reposition of the iris; minimal danger of incarceration of capsule in the wound; infrequency of prolapse of vitreous; greater protection of deeper parts of the eye from infection; absence of pain and bleeding from cutting the iris. The chief disadvantages of simple extraction are: Risks of prolapse of the iris; less efficient treatment of the anterior capsule; greater difficulty in expression of the nucleus; greater difficulty in removal of soft lens matter; greater danger of ring synechia and secondary glaucoma of iritis should occur. The chief advantages of combined extraction are: Greater ease in expression of the nucleus; greater ease in removal of soft lens matter; increased facility in dealing with the anterior capsule, and therefore diminished necessity for subsequent discission; diminished risk of prolapse of the iris; diminished risk of secondary glaucoma. The chief disadvantages are: Greater complexity of the operation, including especially need of more instruments and of the introduction of

more instruments into the eye, and greater duration of the operation; optical and cosmetic disadvantages; greater danger of incarceration of iris and capsule in the wound; greater danger of postoperative glaucoma; pain and bleeding from the iris. H. V. W.

Removal of a Nucleus Luxated in the Vitreous Body During Extraction of the Lens.—Koster, Gzn. W. (*Tydschr. v. Geneesk,* Aug. 3, 1907), treated in his clinic a 55 year old man for serious irido-cyclitis of the left eye. Through the diffuse opaque cornea a lens-shaped body could just be distinguished in the anterior chamber. The right eye was aphaic and from patient's report it was probable, that also extraction lentis was tried in the left eye; the lens-shaped body was therefore most probably the lens-nucleus, which became luxated in the vitreous body during the operation and now appeared in the anterior chamber. Tension was not higher. A few days later the nucleus was removed through a linear incision in the lower cornea. The eye became quiet directly; a few days later only some irritation reappeared, which soon ceased. The cornea cleared a little, but remained diffusely opaque. The patient left on May 3, 1906, with vision of the left eye without correction 3/ccc; the right eye had vision 2 x with + 5.

Patient had consulted some colleague in 1898 for Myopia gravior and Cataracta zonularis of both eyes; extractio lentis of the right eye then was done with success. In 1899 discission was done of the left lens, later linear extraction followed, but the lens slipped in the vitreous body, inflammation set in, but after some time the eye became quiet. Vision of the left eye was then with + 5 ⊃ cyl. + 1. axis 60° nas. = 5/lx, right eye with + 5. ⊃ cyl. + 1. axis horiz. = 6/xii. Most probably the eye remained quiet as long as the nucleus remained in the vitreous body; body; inflammation set in with the displacement in the anterior chamber, mechanical irritation of the iris and ciliary body will have been the chief cause, as secondary glaucoma was absent.

The vision of the right eye in these 7 years diminished considerably from 5 x to 2 x; sympathetic inflammation was not the cause. As we have here myopic eyes, the chorio-retinitis,

which accompanies progressive myopia will have been the cause, while the hyperemia, which with the strong inflammation in the left eye also must have been present in the right one, will have been also detrimental.

One year later, in July, 1907, vision was the same as before in May, 1906. The left cornea had cleared considerably, light perception was good so that discission of the present secondary cataract may ameliorate the vision.

The case shows that a lens without its capsule had been well tolerated in the vitreous body during 7 years, which is of importance for trying reclination, if it should be indicated; and it shows, that the prognosis is not absolutely hopeless, when the lens becomes luxated in the vitreous body during extraction. But a lens-nucleus in the vitreous body will always be a dangerous foreign body, so that everything should be tried to remove it, when accidentally during the operation the lens becomes luxated. E. E. B.

On a Simple and Safe Method of Discission of Secondary Cataract.—Levinsohn, G., Berlin (*Klin. Monat. für Augenheilkunde,* XLVII, 11, September, 1908, p. 295). The chief reason why the membrane often escapes the knife or needle is, that all instruments introduced into the anterior chamber, attack the secondary cataract at a too acute angle, so that the cutting effort can only be minimal. Therefore L. devised a sickle-shaped knife which can be introduced into the anterior chamber just as easily as a straight needle. It cuts the membrane under a right angle and the incision can be extended to the opposite pupillary margin, or even into the iris for iridotomy. Any traction on the ciliary body or destruction of the vitreous is avoided, and even more resistent secondary cataracts can be cut with the instrument. C. Z.

CASUISTICS.

Blindness in Hamilton County with Special Reference to Ophthalmia Neonatorum. Stricker, Louis. Cincinnati (*Ohio State Medical Journal,* Aug. 15, 1909), refers to the law passed by the Ohio Legislature in 1908 granting a pension of $150.00 to every *needy* blind person. The law provides that a registered physician and a citizen swear be-

fore a notary that the applicant is blind, needy and a citizen of the state and county for the requisite time. Since no provision is made for an examination by a competent oculist it is easy for unscrupulous persons to make fraudulent claims. Among 450 blind persons, but thirteen were found self-supporting. The blind in Ohio are now costing the state about $500,000. The author refers to the Medical Record Blank adopted and gives the standard defining three degrees of blindness. Numerous statistics relating to degrees and causes of blindness are given, also the law on the statute books of Ohio relating to inflammation of the eyes of infants. In the cases analyzed 58.9 per cent. were due to preventable causes. The writer concludes: "First. That the pension is of inestimable benefit to a large dependent class, whose conditions as a whole are deplorable. Second. That more than half of them are too old to help themselves or to accommodate themselves to their surroundings. Third. That the teaching at the Blind School has benefited but few, and of these but a very small proportion ever become self-supporting. Fourth. That there is need of workshops in the large centers of population of the state to supplement the work at the Blind School. Fifth. That the Health Department, both local and state, ought to take a more decided stand and see that the laws regarding ophthalmia neonatorum already on the statute books, be enforced. Sixth. That a campaign of education (regarding some of the most common and most easily prevented causes of blindness) be inaugurated —to the end that the numbers of the blind be materially lessened. M. D. S.

The Extent and Variety of Refraction Cases in Cleveland.—Baker, L. K., Cleveland (*The Cleveland Medical Journal,* September, 1909). In a series of 1,000 eye cases of two Cleveland oculists, the average of refraction cases is 51.6%. After giving numerous statistics of examinations of the eyes of school children with resulting conclusions, the writer says that, "Leaving out 72, 100 children under six years of age and 10% of the people over 40 years of age and many cases of low troublesome degrees of ametropis, we may summarize as follows:

For 322,390 people 6-40 years old.....41,386—12.2%
For 120,510 people 40-100 years old.....98,159—90%
Of 433,900 people, glasses are needed by.....135,545—27%

The economic as well as the clinic varieties of refraction cases are discussed, and means of caring for indigent cases and those of very limited means considered. M. D. S.

On the Condition of the Eyes of Deafmute School Children. Snegireff, K. W., Moskau. (*Klin. Monat. für Augenheilkunde,* XLVII, 11, Juli, 1909, p. 65), reports on his examinations of 100 deafmutes of Arnold-Tretja-Koff's school at Moskau, 65 boys and 35 girls, aged from 9 to 19 years. Of the various observations, arranged in tabular form, the following are of chief interest: In 85 the onset of deafmutism could be ascertained, in 44 of these, i. e., 51.76%, it was congenital. In 50% of the acquired form meningitis was the etiological factor. This is important for the eyes, as meningitis also produces severe ophthalmoscopic changes with deterioration of vision.

Twenty-eight had emmetropia, 63 hyperemetropia, 9 myopia, 11 hyperemetropic astigmatism, 6 of the myopic eyes had astigmatism. Seventy-eight per cent. had normal and supernormal vision, 90% good vision, i. e., above 0.50. This corresponds with the statements of other authors.

S. found the following changes in the eyes: retinitis pigmentosa, 2 cases; atrophy of optic nerve, 2; chorioiditis, 2; diseases of lids and conjunctiva, 18; of cornea, 9; cataract, 1; congenital amblyopia, 3; staphyloma posticum, 7; divergent strabismus, 1; venous pulse at the dics, 9. The affections of the lids and conjunctiva were of scrophulous origin, the corneae generally showed old maculae. One case of atrophy of the optic nerve was from typhoid at the age of 2 years, when the child became deaf and dumb. The etiology of the second case was not known. From his and other observations S. infers that pigment degeneration of the retina occurs in deafmutes in 3 % of the cases.

The last table gives the ocular affections in deafmutes from the observations of Alder, Badel, Lee, Schaefer, H. Cohn and the author, and shows that most diseases occur in the retina, optic nerve and retina. S. ascribes this to the prevalence of meningitis and infectious diseases in the etiology. These affections are chiefly found in deafmute school chidren, very rarely in other children of the same age. C. Z.

CHOROID.

Chorio-Retinitis Tumida.—Kipp, C. J., Newark, N. J. (*Arch. Ophthal.,* July, 1909, XXXVIII, 382), describes a case of chorio-retinitis tumida occurring in a patient aged thirty-four years. On the temporal side of the disk, the retina was raised 1 m. m. and slightly milky. The raised area extended above somewhat higher than the upper margin of the papilla, and somewhat below the lower margin; towards the macula it extended somewhat more than the breadth of the disk. It rose abruptly on the margin of the disk, and gradually sloped to the level of the normal retina outward, upward and downward. There were numerous silvery spots and lines in it, and some extravasation of blood. Thirteen and one-half months later the retina was on a level with the disk, and vision was 6/xii.

The author was unable to assign any cause for the lesion, though the patient was placed on potassium iodide.

Kipp looks upon these cases as being primarily a circumscribed choroiditis in which the retina over the focus becomes raised and involved in the morbid process by an exudation from the choroid. W. R. M.

CONJUNCTIVA.

Treatment of Blenorrhoea Neonatorum.—Fukuda (*Wiener Medizinische Wochenschrift,* May 15, 1909).

The author recommended, in cases of blenorrhoea neonatorum with copious secretion, the use of a 4% solution of nitrate of silver; and if the case is a severe one he employs the silver twice a day; in still severer cases he uses a 6% solution; he then washes off the superfluous solution with a large amount of water. J. G.

Unusual Complication in a Case of Blenorrhea in an Adult.—Sommer, Littan (*Wochensch. f. Therap. u. Hyg. des Aug.*, May 20, 1909), reports a case of gonorrheal conjunctivitis in a woman 24 years of age complicated by lid abscess and extensive involvment of the lymphatics; the preauricular, submental and upper cervical were unusually swollen and tender. Gonococci were found in the lid abscess. The condition is similar to that of periurethral abscess in urethritis. The

gland involvment was probably due to the action of toxines. Later an abscess formed in the glands of Bartholni. W. Z.

Ophthalmia in Queensland. *The Australasian Medical Gazette* of August 20, 1909, reports a scheme introduced by the Department of Public Instruction of Queensland to deal with ophthalmia in the schools. In places where there are schools and hospitals the doctor is to receive £30 per annum for his services and £20 per annum for drugs, etc. In places where there are schools but no hospitals or where there are only itinerant teachers who visit isolated families, the treatment is to be left in the hands of the teachers, who are to be supplied with lotion and ointments. Many schools have now been fitted with fly-screens and the system is being extended as far as possible. F. P. M.

Pecular Blastomycetoid Organisms Met in Two Cases of Parasitic Conjunctivitis. Posey, Carpenter, Hosmer and Smith (*University of Pennsylvania Medical Bulletin*, November, 1908). This report is made for the double purpose of placing upon record the observation of these fungus bodies in two cases of conjunctivitis in human beings, and the unusual characteristics of the organisms encountered.

The first case appeared in the case of Dr. John F. Carpenter. A boy, white, twelve years old and in excellent health, had about a month before applied for treatment to an injured eye by falling upon a stick which abraded the conjunctiva. A papillomatous growth of several mm. diameter, tongue shaped, rounded surface, soft and moderately red, existed in the lower inner conjunctival cul-de-sac. The growth was removed by the physician, placed in formaldehyde solution and examined by Dr. Hosmer, who found the bodies. The wound healed by first intention, no recurrence, no systemic disturbance.

The second case occurred in the practice of W. C. Posey a few days after the first (both in the winter of 1906-1907), presenting much the same history. No connection between the individuals. A boy, white, fifteen years old, sustained a slight injury four weeks previously by being struck in the eye by a tennis ball, resulting in monocular conjunctivitis, some conjunctival edema. When seen by Dr. Posey this had largely

subsided, the conjunctiva being practically normal. Ten to fourteen days after the acute symptoms had subsided a polypoid growth 3 mm. in diameter, with a short, soft pedicle of a light red color growing from the tarsal conjunctiva of the upper lid 5 mm. from the ciliary margin. The growth was solitary and had a smooth surface. On excision very little bleeding, healing prompt, no recurrence, no systemic disturbance.

The growth was placed in formaldehyde solution and sent for histological examination, when in due course the parasitic bodies were found and the practical identity with those of Dr. Carpenter's case were at once recognized.

Since then numbers of cases of conjunctival nodules have been examined by different ophthalmic surgeons of the city, thus far without success. The histological features of our two growths were practically identical and the parasitic bodies undistinguishable one from the other.

A very detailed microscopical description is given, with six cuts showing the sporo blasts under different magnifications and different stains, as well as many intermediate forms.

A. M. MacW.

CORNEA.

Keratitis Marginalis Profunda (Fuchs).—Meyerhof, M., Cairo (*Centralblatt für prakt. Augenheilkunde*, August, 1909, p. 236). An otherwise perfectly healthy man, aged 36, complained for 2 days of lacrimation, photophobia, pain and redness of his right eye. There was pericorneal injection, pupil narrower than the others, slight pain to the touch, and 2 deep greyish yellow infiltrations at the temporal limbus, 5 at the nasal limbus, V normal. The treatment consisted in atropin and warm applications. After 3 days the small abscesses were fused into 2 purulent seams, each occupying one-third of the corneal circumference. The cornea over the abscesses was dull, but could only slightly be stained with fluorescin. Gradually small loops of blood vessels covered the marginal abscesses, and the yellow color soon disappeared. The patient returned after 3 weeks. The eye showed slight pericorneal injection, 2 semicircles of grey opacities at the limbus without subjective ailments. The affection undoubtedly was due to infection, the source of which, however, could not be ascertained.

It is very rare. The peculiarity lies in the discrepancy between the threatening aspect and the absolute harmlessness of the disease. C. Z.

The Treatment of Interstitial Keratitis.—Bray, Aaron, Philadelphia (*Therapeutic Gazette,* October 15, 1909). calls attention to the need of getting the confidence of the patient in this disease on account of its protracted course. General hygienic rules, as a daily bath, simple diet, and an abundance of fresh air are the first requirements. A mild antiseptic wash is used several times daily. Suprarenal extract often acts very favorably in reducing the photophobia. For the latter warm moist compresses are useful, being soothing and also helpful in hastening the retrogressive stage. Atropin, of course, is used, and next in importance is dionin, usually in four per cent. solution. Constitutional treatment for the underlying cause, syphilis especially, rarely tuberculosis and what Dr. Risley terms diseases of nutrition, is rigidly followed. Mercury in different forms, preferably by the inunction method, occasionally thyroid extract, and tonics are employed. The bowels are kept in proper working order. During the declining stage, dionin and atropin are used in the form of an ointment with massage. Calomel may also be incorporated and is a good drug to alternate with dionin. When the drug is irritating holocaine may be added. Occasionally it is necessary to use surgical methods such as paracentesis of the cornea or iridectomy.

M. D. S.

A Case of Interstitial Keratitis Probably Due to Autointoxication.—Williams, Hugh Blake, Chicago (*Jour. Ophthal. and Oto-Laryng.,* August, 1909, iii, 308), reports a case of interstitial keratitis and iridocyclitis occurring in a patient aged 23 years. A diagnosis of autointoxicaton was made and the patient placed upon appropriate diet, tonics, and intestinal antiseptics. Improvement followed with vision = 20/20. W. R. M.

Several Unusual Forms of Superficial Inflammation of the Cornea.—Posey, Wm. C., M. D. (Section on Ophthalmology of the College of Physicians, Philadelphia, Oct. 16, 1908). Case 1. A boy nine years old, seen for an inflamma

tion of the left eye of three weeks' standing. Lids moderately swollen, photophobia and lacrymation. The child in poor health for some months previous, suffering from colds in the head and sore throat. The right eye unaffected. Examination showed a moderate amount of conjunctival irritation in the left eye, hazy cornea in part, opacity limited to the upper, outer quadrant. It was superficially situated and typically dendriform in appearance, separated from the rest of the cornea by sharp lines of demarcation. The opacity was distinctly raised above the surface, and had a rather glistening, whitish appearance, due to thickened epithelium. No discoloration from fluorescein. As time went by, the extension of the opacity was rather over the surface of the cornea than into its substance, and was treated with boric acid, atropine, yellow oxide of mercury ointment, dionin with hot stupes and proper treatment of the systemic condition and that of the air passages. The opacity continued until the pupillary area was almost covered. After several months of continuous treatment the haze began to lessen and in another two months, by the use of a 2% solution of holocaine the opacity had so contracted that the pupillary area was free. Two months later the eye was practically quiet, vision had risen to 5/ix, while previously it had been fingers at a metre.

The curious facts of this case are its appearance as a dendriform ulcer, although he believes it rather allied to the superficial punctate keratitis of Fuchs; the unbroken epithelial surface; slow recovery with complete restoration of vision; no corneal haze. This case had been previously treated when eight months old by the writer for vernal conjunctivitis in both eyes. No relapses have occurred during the succeeding summers.

Case 2.. A boy, five years old, brought to the hospital for a haze which had begun two months previously. The lids somewhat swollen, photophobia and lacrymation. History negative, except for a slight swelling of the glands of the neck on the left side.

Examination revealed a Y-shaped opacity, the base of the Y in the limbus, bifurcated, and extended within three or four mm. of the nasal and temporal limbus. The opacity was elevated, and sharply defined by a regular line of demarcation,

grayish-white, under high magnification was seen to be composed of a homogeneous tissue, studded with small dots and traversed by fine lines. With the exception of one blood vessel the opacity was bloodless. The right eye normal.

Treatment: Massage of globe with ointments of dionin, atropine and hot stupes locally, and cod liver oil internally.

Diagnosis: Epithelial hyperplasia, cause unknown, probably allied to the superficial punctuate opacity of Fuchs.

A. M. MacW.

GENERAL DISEASES AND THE EYE.

Contribution to the Experiences of Infections of the Eyeball After Operations (Erysipelas).—Cramer, E., Kottbus (*Zeitschrift für Augenheilkunde,* XXII, September, 1909, p. 211). Three days after an operation for ptosis, according to Hess, in local anesthesia with subcutaneous injections of cocain-adrenalin solution, erysipelas developed with an immense abscess and ulceration of the sclera and cornea. The sloughing of the cornea was prevented by transplantation of a conjunctival flap, according to Kuhnt's method, with preservation of the eyeball, and the prospect of restoration of some sight after subsidence of all irritation. C. Z.

Concerning Febris Uveo-Parotidea Subchronica Localized in the Parotid Gland and the Uvea and Often Complicated with Paralysis of the Cerebrospinal Nerves. —Heerfordt, Copenhagen (*Graefe's Arch.,* LXX, H. 1, April, 1909.) Three cases were observed by H. and from their study he concludes that:

1. In association with the cases recorded by Daireaux-Pechin and by Collomb the author's cases complete a well-defined group with such peculiarities that for the present it seems proper to consider it as a special disease "febris uveo-parotidea subchronica" in order to distinguish it from epidemic parotid fever.

2. As characteristics of this affection are to be noted: the protracted course; the low, long-enduring fever, and subchronic localized involvement of the parotid gland and of the uvea, and further frequent occurrence, as a complication, of pareses

of the cerebrospinal nerves. Finally, in the experience of the author, the disease is but slightly contagious.

3. The parotid gland and the uvea are to be considered as the true localization of the disease through under certain conditions, the uveitis appears before the parotitis. The pareses, on the contrary, are to be considered complications the result of toxines, as they so quickly disappear, and so far as is known do not accompany the organic symptoms.

4. The important characteristics in which this affection agrees with epidemic parotitis makes it possible that the two conditions are excited by the same or modified organisms, but until this is determined or until transitional types between these two affections are described it seems to the author that it is proper to consider it an atypical form of epidemic parotitis.

W. Z.

Report of Case of Transient Cycloplegia Due to Glycosuria. Roberts, W. H., Pasadena, Cal. (*Arch. Ophthal.*, July, 1909, XXXVIII, 387), reports a case of paralysis of accommodation, due to diabetes, occurring in a patient aged fifty-one years, who consulted the writer in regard to a throat involvement.

At the time of the first examination, urinalysis showed seven per cent. sugar. Under diet, the sugar decreased to three-eighths per cent. and shortly afterwards a paralysis of accommodation occurred which lasted for several months. Roberts refers to the fact that the cycloplegia did not appear until the patient's health began to improve and the sugar had decreased from seven per cent. to three-eighths per cent., and suggests that a similar toxin to that causing a post-diphtheritic paralysis may have caused the lesion.

W. R. M.

Neuroretinitis in Chlorosis, with Report of a Case. Posey, W. C., Philadelphia (*Arch. Ophthal.*, September, 1909, xxxviii, 473), reports a case of neuroretinitis due to chlorosis occurring in a patient aged 21 years. The condition was bilateral and there was marked oedema of the retina in the right eye. The ophthalmoscopic picture shows a neuroretinitis of marked degree, the fundus changes being extensive, while the blood examination showed but a moderate anaemia, hemoglobin being 60%. The administration of iron was followed by rapid im

provement. The article is illustrated and a review of the literature is given. W. R. M.

Eye Changes in Bright's Disease.—Kalish, Richard. New York City (*American Medicine,* September, 1909), emphasizes the fact that swelling of the eyelids is often due to other causes than nephritis, but says that the presence of puffiness of the lower lids in the morning and its absence in the evening, together with a high tension pulse, hypertrophy of the left ventricle and accentuated aortic second sound, constitute a galaxy of symptoms indicative of interstitial nephritis even if urinalysis renders a negative verdict. Subcutaneous and subconjunctival hemorrhages, if recurrent, should arouse suspicion of a possible renal disease. They are, without doubt, due to the general artero-sclerosis which is so generally associated with many forms of nephritis. External ophthalmoplegia doubtless depends upon changes in the cerebral vessels similar to those in the retina. The fundus appearances in albuminuric retinitis are described and its probable vascular dependence mentioned, which seems more probable in that a very large percentage of cases occurs in syphilitics. He emphasizes that "The extent of the retinitis bears no relation to the severity of the renal involvement or to the amount of albumin contained in the urine," and that, "As a rule visual reduction is markedly disproportioned to the apparent gravity of the ophthalmoscopic picture. M. D. S.

Ocular Disturbances During Pregnancy.—Pfingst, A. O., *American Practitioner and News,* July, 1909 (*Abs. Charlotte Med. Journ.,* September, 1909), says that in some cases various sized hemorrhage areas are found scattered over parts of the fundus, the result of diseased blood vessels. Visual disturbances vary in these cases and are in no way in proportion to the area of retina involved, extensive pathological changes causing at times slight disturbances of vision, while minute changes may affect the vision perceptibly. High degrees of amblyopia have been observed but complete blindness is rare. Both eyes are nearly always affected, though not always in the same degree. The defect of vision is usually insidious in its development. It may be mentioned that uremic poisoning may suddenly develop during albuminuric retinitis and cause sudden blindness.

The prognosis with reference to visual acuity is not altogether unfavorable, total blindness being exceptional and improvement in vision after induction of labor being at times quite marked. However, the higher the degree of amblyopia during the pregnancy the less hopeful would be the prognosis for the mother after the removal of the cause.

Hirst, Silex and many others advocate interference with the pregnancy in every case of labor, complicated with Bright's retina. As the danger of permanent blindness increases with the duration of the inflammation, some advocate the induction of labor in these cases if occurring before the sixth or seventh month, and unless retinal changes be very pronounced, the disturbance of function great and urinary examination unfavorable, dietetic and medicinal treatment is advocated when occurring later. H. V. W.

A Case of Xanthopsia in Nephritis Due to Pregnancy.—Yamaguchi, H., Tokio, Japan (*Klin. Monat. für Augenheilkunde,* XLVII, 11, August, 1909, p. 160). A woman, aged 21, in the eighth month of pregnancy, suffering from albuminuria, edema of the lower limbs, headache, lack of appetite, suddenly on rising in the morning saw fixated objects yellow, the periphery normal, then grey. V fingers at 4 m., light sense 15 m., she could not distinguish colors except violet. VF. contracted upwards, relative central scotoma between 0° and 20°. The xanthopsia gradually disappeared after artificial abortion, and the recovery with normal sight was complete after 2 weeks. Whether the xanthopsia was of central origin (color hallucination, according to Hilbert who observed xanthopsia in internal diseases) or caused by the effects of toxins (from albuminuria) on the visual tissue, is left undecided. C. Z.

Exophthalmos and Other Eye Signs in Chronic Nephritis.—Barker, Lewellys F., and Hanes, Frederick M., Baltimore (*Amer. Jour. Med. Sciences,* October, 1909). The purpose of this communication is to direct attention to the frequent occurrence of exophthalmos of chronic nephritis, and to advance the view that the exophthalmos of chronic nephritis is very analogous to that of exophthalmic goitre, being but one of a number of evidences of a chronic systemic intoxication.

Exophthalmos can be easily produced experimentally by stimulating the cervical chain of autonomic fibres, this exophthalmos being due to the contraction of a cuff of plain muscle which, attached to the septum orbitale anteriorly and to the equator of the eyeball posteriorly, acts as an opponent of the recti muscles of the eye and produces exophthalmos when it is tonically contracted. This cuff of plain muscle is under the control of the autonomic fibres passing to the eye through the cervical autonomic chain. It seems unquestionably true that toxins produced by certain diseases are capable of stimulating the autonomic system and producing among other effects, exophthalmos.

The writers show that exophthalmos is not an infrequent sign in chronic nephritis; it was present in 48 per cent. of cases observed. Those patients who presented evidences of serious intoxication (suburemic or uremic symptoms) most frequently showed exophthalmos and one or more of the allied ocular signs—aniscoria, von Graefe's, Moebius', or Stellwag's sign. All of these classic signs of exophthalmos goitre may be present in a maximum degree in chronic nephritis without the thyroid showing any apparent involvement. The conclusion lies very near, that in both diseases a chronic systemic intoxication affecting the autonomic system is the causative factor in the production of the ocular manifestations. C. H. M.

Ophthalmological Experiences in the Present Epidemic of Relapsing Fever. Natanson, A., Moskau (*Klin. Monat. für Augenheilkunde,* XLVII, 11, September, 1909, p. 250), observed 3 epidemics of relapsing fever within the last 20 years. In 1908 there were reported in Moskau, with a population of about 1,500,000, 8,806 cases. Within the last year N. saw 40 cases of ocular affections in relapsing fever, besides 5 women, all grown men. Unilateral affections were more frequent than bilateral. They generally consisted in iritis or iridocyclitis with abundant opacities of the vitreous, more rarely in the latter alone without signs of external inflammation. Some of these were sensitive to touch at the ciliary region. The opacities of the vitreous generally preceded the visible signs of iritis or iridocyclitis. Besides dust-like opacities and moving flakes, now and then larger, dense, bluish opaque membranes in the anterior portion of the vitreous

were observed. The course was decidedly benign, and milder and more rapid at the acme of the relapsing fever than during reconvalescence. Only exceptionally, in large series of observation, e. g., by Logetschnikow, on over 700 cases, unfavorable terminations were encountered: occlusion of pupil, opacities of lens, detachment of the retina, shrinking of the eyeball.

With regard to diagnosis and prognosis one must think of the frequency of affections of the anterior portion of the uvea and the vitreous at the time of an epidemic of relapsing fever. Especially are those cases suspicious, in which blurred sight precedes the inflammatory symptoms for some time. This is illustrated by a case of bilateral iritis with opacities of the vitreous during a secondary syphilitic relapse in the fifth month of relapsing fever. The affection healed completely in 6 weeks. Three other cases are reported in which traumatism came in question. Traumatism, colds, getting wet may be predisposing elements for the outbreak of iridocyclitis and hyalitis.

It is now considered an established fact, that the spirillae of relapsing fever are transmitted by the body louse (pediculus vestimenti). Whether the uveal inflammations is caused by embolism from the infarctions of the spleen or by toxins is undecided.

For the treatment of the eye affections atropin, dionin and moist heat are sufficient. In tardy resorption of numerous opacities of the vitreous, iodide of potassium was ordered. N. urgently warns against the employment of atoxyl and arsacetin in relapsing fever, on account of their dangerous effect on the visual organ. C. Z.

Syphiloma of the Testicle and Parenchymatous Keratitis After Inoculation of Syphilitic Virus.—Mezincesen, Dr. Galatz (*Deutsche Med. Woch.*, 1909, No. 27, p. 1188), inoculated serum, obtained by suction from a syphilitic papule, into the testicles of rabbits. After 35 days infiltrations developed at the places of injection, which turned into ulcers, and contained numerous spirochaetae. The testicles showed gummata with central caseous degeneration, as found in tertiary syphilis. In one rabbit a bilateral parenchymatous keratitis with numerous typical spirochaetae developed 50 days after the primary affection was healed. C. Z.

GLAUCOMA.

Anterior Synechia and Hypertony.—Fuchs. Vienna (*Graefe's Arch.*, LXIX, H. 2, November, 1909). In this study of the relation between these two conditions Fuchs examined 70 eyes, including instances of spontaneous iridocyclitis, recent and old corneal injuries, ectasic corneal scars with increased T. The results were surprising to Fuchs, as he states that it is usual to find in these cases of anterior synechia with simultaneous increase of T. the anterior chamber in great extent obliterated. He had expected where there had been no increase in T. to find such obliteration absent, or at least limited to that portion corresponding to the position of the anterior synechia, but on the contrary he found that a very extensive adhesion of the base of the iris to the periphery of the cornea could exist without necessarily producing an increase in T. The adhesion simply predisposes to hypertony, and why in some cases it is present and in others not is still to be determined. The therapeutic lesson taught is to prevent the peripheral adhesion of the iris. Nature does this in the restoration of the anterior chamber by the collection of aqueous humor and the traction of the sphincter. The latter factor is lessened by the fixation of the sphincter to the cornea, this affecting not only the action of the affixed portion, but in a measure the free portion of the iris. This part is drawn towards the cornea and the more this is the case the less will be the traction power of the sphincter, the component of this force which draws the iris from the cornea. As the power of the sphincter is paralysed by atropin, in the healing of an ulcer it is perhaps better not to continue its use too long, but only until the accompanying iritis is on the decline. W. Z.

Concerning the Form of the Nasal Defect in the Nasal Field in Glaucoma. Rönne. Copenhagen (*Graefe's Arch.*, LXI, H. 1, July, 1909), points out that the retinal fibres which arch above and below the fovea from the papilla meet in the temporal half of the retina in a sort of raphe in the horizontal meridian. It is clear that the presence of this raphe can be demonstrated in the visual fields of affections which involve the retinal fibres in bundles. As has been shown by Bjerrum, it is just these

arching fibres which are affected in glaucoma and give rise to the arched field defects. The author has found that the boundary of the visual field in glaucoma is frequently seen to follow the nasal horizontal meridian, corresponding to the field projection of the temporal raphe of the retinal nerve fibres.

A typical field will show that the nearly vertical nasal margin of the field abruptly runs along the horizontal meridian for a distance and then again assumes a vertical direction. The boundary thus assumes a terraced form which runs for a certain distance exactly along the horizontal meridian. This form of field might be termed the "nasal leap" (sprung) of the glaucoma field. The horizontal hemianopic field in glaucoma is a development of this type. To detect this form of field it is necessary that the test-object be freely moveable and should never be moved along the horizontal meridian in mapping out the nasal field. It should be brought in either 5° above or below the horizontal meridian, and the boundaries of the blindspot must always be accurately determined. The author is convinced that this type of field is often present in glaucoma and that diagnostically and theoretically it stands in relation to the arch defect of Bjerrum. W. Z.

Glaucomatous Rise of Tension in Keratitis Disciformis and Herpetiform Diseases of the Cornea. —Erdmann, P. (From the eyeclinic of Prof. A. Peters in the University of Rostock, *Zeitschrift für Augenheilkunde*, XXII, Juli, 1909, p. 30), reports 3 cases of typical keratitis of Fuchs, characterized by a central disciform opacity composed of minute dots, with a sharply defined grey margin, slight participation of the uvea and protracted course. Unusual was the increased tension observed in E.'s cases. The first required iridectomy, the others yielded to repeated instillations of eserin, hot applications and punctures of the anterior chamber. From these and clinical observations of Peters and anatomical investigations of Hartels it seems not improbable that keratitis disciformis in a number of cases is a herpetiform affection of the cornea and that the necrosis which causes the disciform opacity depends, not as Fuchs and Meller surmise on an inflammation caused by still unknown bacteria, but on disturbances of innervation. C. Z.

INJURIES.

Casuistics of Gun-Shot Wounds of the Eye.—Berlin, Johannes, Zalielsdorf (*Inaugural Dissertation Giessen,* 1908). The author gives description of the etiology, mechanism and statistics from the literature of such injuries, describing six cases, occurring in the University clinic of Vossius at Giessen.

Case 1. Attempted suicide with a pocket revolver. Injury behind eye, protrusion of eye, sealing of lids, blood in the vitreous. Tension +. Blindness. Left eye enophthalmous; anterior chamber full of blood, rupture of sclera, blindness. Small bullet discovered in the left orbit by the Roentgen Ray. Removed under the lower lid with cocaine. Blindness both sides. Phthisis bulbi.

Case 2. Injury received in left temple from a Flaubert rifle ball, received from a comrade by a boy while playing Indian. No pain, but swelling and ecchymosis, ectropion under lid. Blindness. Treatment with Hydrarg. oxycyan., 1 to 1000. Sajodin internally. The next day right eye irritable. Roentgen ray showed bullet in the inner orbital wall, left eye. Double perforation of the bulb. Atropine and dionin used. Ball not removed. Two months after right eye normal. Left eye atrophic.

Case 3. Explosion fire works. Swelling, burning, and impaction of powder in face and lids. Central perforation cornea, left. Powder grains in right lid and conjunctiva. Treatment, sublimate, atropin, vaselin. Results, left eye projection of light; right, V. 5/iv.

Case 4. Bird shot left side face and left eye. Wound of sclera 2 mm. from limbus. Cornea and lens clear, vitreous slightly turbid, hemorrhage under the papilla, in the middle of which, what seemed to be shot. Roentgen ray showed the shot also in the orbit. Shot not removed. Five months later V. 5/xxv.

Case 5. Bird shot injury. Many wounds nose, right eye. Lid and conjunctiva chemosed. At the limbus a small perforation. Vision light projection.

Therapy, atropin, aspirin. Roentgen ray showed 11 shot in the region of the eye. Not removed. Vision, fingers one meter. Eccentric outwards.

Case 6. Wound, shot in forehead by a revolver at about 2½

meters away. No sight either eye. Nose bleeding. Wound over eye but both lids swollen. The ball small. Exenteration of the eyeball. Pus found later. Ball discovered by Roentgen ray in the under part of the sella turcica in the sphenoidal bone in the medial line. Result, healing of wound, total blindness. H. V. W.

Report of a Cilium in the Anterior Chamber. Barr, W. A., Chicago. (*Jour. Ophthal. and Oto Laryng.*, September, 1909, iii, 352), reports a case of cilium in the anterior chamber occurring in a man who had been injured in the eye twelve years previously, by a splinter of wood. Two weeks before the case came under the observation of the author the patient received a blow on the head and this was immediately followed by a mild irido-cyclitis. Examination showed that there had been an absorption of the lens from the original injury with a partial posterior synechia. There was a small leucoma in the center of the cornea from the posterior surface of which a cilium extended backwards to the lens capsule. A corneal incision was made and the cilium removed.

The author calls attention to the duration of the foreign body in the anterior chamber without causing irritation and believes that from the time of the original injury to the time of the blow on the head both ends of the cilium were attached and that the force of the blow dislodged the corneal attachment, thus causing irritation and an iridocyclitis.

W. R. M.

Injury of the Lens by a Piece of Iron Without Traumatic Cataract.—Marx, G. (From the eyeclinic of Prof. O. Schirmer in the University of Strassburg. *Klin. Monat. für Augenheilkunde*, XLVII, II, August, 1909, p. 178). In most cases published under this title a more careful examination revealed more or less a partial opacity of the lens, with perhaps 2 exceptions, the cases of Désmarres fils and Laqueur. M. claims for his case exactness, as it was examined with all disposable diagnostic methods: 2 days after the injury a piece of iron in the lens was diagnosed with sideroscope and focal illumination. The eye was very much inflamed. At the wound of the lens there was a posterior synechia and an accumulation of pus. The piece of iron was extracted with Volkmann's

giant magnet by the same way it had entered. The next day a slight gray opacity was visible at its former seat, which could not be recognized any more after 24 hours. Three months later the lens was clear but showed irregular refraction at the place of injury.

M. assumes that soon after the injury the capsular wound was closed and by the coagulation and the adherent iris a firm wall was established against the entrance of aqueous. After the magnet extraction an immediate closure by fibrin from the aqueous must have occurred.

While such a favorable result of injury of the human lens is extraordinarily rare we find that in animals, especially the rabbit, frog, fish, birds and goat the lens as a rule reacts to injuries with the formation of slight or partial cataract.

C. Z.

On the Estimation of Injuries of the Eye by Luminous and Ultraviolet Rays. Birch Hirschfeld, A., Leipzic (*Klin. Monat. für Augenheilkunde,* XLVII, II, Juli, 1909, p. 26), once more gives his views with reference to Best's essay on the same subject (*Klin. Monat.,* Mai, 1909, p. 520, reviewed in *Ophthalmology*). He opposes the statement of Best, that the ultraviolet rays of our artificial sources of light are perfectly irrelevant for the eye, and maintains that, besides the luminous, the ultraviolet rays may injure the retina, not only in intensities which can only be employed in experiments, but also under ordinary conditions. The smoke colored coquilles are sufficient for most practical purposes but not the blue ones, which Best ranks in the same order, not only because their absorption of the short waved rays is less than that of the smoke colored, but also because they transmit the very active blue luminous rays. C. Z.

On Parenchymatous Keratitis After Injuries. Hoeber, Josephine, née Marx, Berlin (From the eyeclinic of Prof. O. Haab in the University of Zuerich. *Beiträge zur Augenheilkunde,* Heft 73, p. 1), discusses the question, how far a traumatism may be the cause for developing a parenchymatous keratitis in an individual, affected with a constitutional anomaly, viz., hereditary or acquired syphilis, scrophulosis or tuberculosis. He reports 28 cases from the literature of the

last 10 years and, in detail, 4 from the eyeclinic of Prof. Haab and one from the practice of Dr. Sidler-Huguenin. Among these were cases in which the traumatism occurred in individuals with undoubted constitutional diseases, others in whom their existence had to be proven by especial diagnostic means, and others, in whom a dyscrasia could not be ascertained nor excluded. The author reaches the conclusion that the occurrence of traumatic parenchymatous keratitis in constitutional anomalies cannot be doubted. C. Z.

Epilepsy Following a Faulty Enucleation of the Eyeball. Kinderman (*Wiener Medizinische Wochenschrift*, July 3, 1909).

An eye had to be enucleated on account of an injury with a piece of iron. Three years later epileptic seizures made their appearance; the stump of the optic nerve was then resected, and after an examination, it was found to be imbedded with some remnants of sclera choroid and retina in the form of a solid scar.

Operation was followed by immediate improvement.

The author is of the opinion, that the particles of retina which were left in the scar, produced the attacks similar to cortex epilepsy. His attention was directed to the orbit because the patient complained of hyperalgesia in the region of the external nasal nerve during an attack. J. G.

INSTRUMENTS AND METHODS OF EXAMINATION.

Ophthalmo-Fundoscope. Balm, F., (From the eyeclinic in the University of Rome. *Klin. Monat. für Augenheilkunde*, XLVII, II, August, 1909, per 161), describes his new instrument for the examination of the fundus with a magnifying power of over 70, not attained before, and giving pictures without reflexes. It consists of a tube similar to that of a telescope, 10 cm. long. The anterior part is separated in 2 parts, one for the electric lamp, the other for the objective lens, which receives no reflected rays from the cornea, so that the ophthalmoscopic picture is not disturbed by reflexes. The posterior portion has an ocular lens just like a microscope. The adjustment for the eye of the observer is obtained by mov-

ing the ocular lens in the same fashion as in a telescope. By removing the objective lens the instrument can be used as an ordinary ophthalmoscope and, by adding a Recoss' disc, also for determination of refraction. Examination in the inverted image is possible by inserting a small conic tube with a lens + 13.00, with the advantage, however, that the corneal reflex is excluded. The ophthalmo-fundoscope is manufactured by Reiniger, Gebber and Schall, Erlangen, Germany. C. Z.

Observations with Balm's Ophthalmo Fundoscope. Kümmel, Richard (From the eyeclinic of Prof. J. N. Oeller in the University of Erlangen. *Klin. Monat. für Augenheilkunde,* XLVII, II, August, 1909, p. 164), describes several cases examined with the new instrument and thinks that its greater magnifying power will reveal finer changes of the background than the ordinary ophthalmoscope. C. Z.

A New Eye Irrigator. Lewis, G. Griffin, Syracuse (*Jour. Ophthal. and Oto-Laryng.,* August, 1909, iii, 310), describes an irrigator designed for use in treatment of purulent diseases of the eye. The author finds it of particular value in purulent cases attended by ulcer of the cornea where great care is necessary in separating the lids. The instrument has two blades, one passing under the upper lid and one under the lower, so the lids may be raised slightly away from the eyeball, and both upper and lower cul-de-sac and cornea thoroughly flushed. W. R. M.

An Adjuvant for the Removal of Foreign Bodies in the Cornea.—Thorcy, M., Leipzig (*Klin. Monat. für Augenheilkunde,* XLVII, II, September, 1909, p. 319). The patient holds the illuminating lens himself and fixates through it the lamp. It was remarkable how quietly otherwise unmanageable patients stared into the light, so that the foreign bodies could be easily and safely removed. C. Z.

An Axis Skiascope. Starke, Dr., Goerlitz (*Centralblatt für Praktische Augenheilkunde,* September, 1909, p. 260). S.'s instrument (which may be procured for $1.50 from Optician Immisch, Goerlitz, Obermarkt 28), serves to ascertain skiascopically how much in a given case the axes deviate from the vertical or horizontal directions. It consists of a graduated metallic ring of the size of the ordinary ophthalmoscopic lens

and is held vertically before the eye of the patient on a ring-shaped handle. Behind this ring is a movable ring with a firm wire as diameter. The movable ring is turned with the third and fourth fingers until its diameter appears on the illuminated pupil parallel to the skiascopic axis, and its degree is read at the graduation. C. Z.

The Muscle Indicator.—Savage, G. C., Nashville, Tenn. (*Jour. A. M. A.*, Oct. 30, 1909). In the Section on Ophthalmology at the 1908 session of the American Medical Association presented a rough wire model of the instrument which now appears in a perfected form, and claims for it that it will show every phase of any ocular muscle or combination of ocular muscles, normal or abnormal. It answers, I believe, every question that can be asked concerning the ocular muscles and the brain centers that control the ocular muscles.

The device is of use not only in teaching, but also in the management of intelligent people suffering from muscle errors. There is no difficulty in showing the patient what the condition is and what ought to be done for its relief.

The circle is one of many million, all in the same plane. The primary circles, which this one circle represents, must all lie in the same plane, but only one can exist at a time. The circles formed in that plane are constructed through three points, two of them forever fixed and the other changeable. The two fixed points are the centers of rotation of the eyes, and the changeable point is the point of fixation. The next point of fixation may be inside this circle, or it may be beyond it an inch or any other distance to infinity. There are just as many circles possible as there are points in space directly ahead on the line of intersection of the vertical and the horizontal fixed planes of the head. Not only have we millions of possible primary circles, but millions of secondary circles also, all passing through the rotation centers of the two eyes and their planes intersecting in the line connecting these centers. Every object in space lies on one of these circles, and in studying the rotations of the eyes it is easy to see how they are effected and what the condition is. The law that controls the ocular muscles is simplicity itself. The superior and inferior recti must keep the visual axes in the plane of the primary circle. The lateral muscles must regulate those in this plane.

The obliques must forever hold, except under abnormal conditions, the horizontal retinal meridians in the plane of this circle, as well. If one visual axis rises above that plane (hyperphoria) it is shown on the instrument. If the retinal meridian tilts it is shown. There is not a possible state of the ocular muscles but what this instrument can show, and there is not a nerve center that controls the ocular muscles that can not be demonstrated by it. H. V. W.

A New Knife and Method for Iridotomy. Jobson, Geo. B., Jr., M. D., Franklin, Pa. (*The Ophthalmic Record*, September, 1908). The knife was devised by Drs. Hamlin and Jobson. It is somewhat similar to a cystotome, with a large blade set at a carefully calculated angle. This knife makes its own incision in the globe and cuts with a minimum amount of dragging.

The blade is thin and broad and sharp-pointed, and as long as the distance from the posterior surface of the cornea to the iris will permit.

In using the knife the following method of producing an artificial pupil is used: The knife is entered at the upper flap, the point is then turned down and made to penetrate the membrane and with a drawing cut the incision is made. A similar incision is made in a direction opposite to the firm attachment of the iris, which is kept taut while cutting. The knife is then withdrawn and the hole closes perfectly.

The flap which is produced by this incision is drawn out and cut off with iris scissors as in an ordinary iridectomy.

A. M. MacW.

A Simple Method for Ascertaining the Presence of Binocular Vision. Roche (*Wiener Medizinische Wochenschrift*, May 15, 1909).

A piece of cardboard about 30″ long, is held horizontally in the plane of the nasal root; on the cardboard a small paper ball is placed, and the patient is directed to touch the ball with the point of a lead pencil. In binocular vision, the patient will always touch the ball; in monocular vision he never will touch it, but will put the point of the pencil either in the front of, or in the back of the ball. J. G.

IRIS.

The Etiology and Diagnosis of Iritis.—Thompson, P. H., Boston (*Boston Medical and Surgical Journal*, June 3, 1909). A detailed description of the anatomy of the iris is given. The anatomical arrangement and physiological action of the iris presents the conditions necessary to favor the development of an inflammation and attack of dangerous elements, viz., mechanical, electrical or chemical.

The author cites the etiology of various iritis as follows: syphilis, 50 to 75%; rheumatism, 30%; gout, gonococci, traumatism, autointoxication, tuberculosis, diabetes, malaria, and renal disease in the order given.

He divides iritis into acute iritis, giving the symptoms as injection, exudate, discoloration, size of pupil, impairment of vision, pain, photophobia, and lacrymation. He further divides iritis into plastic, serous, parenchymatous, suppurative, spongy, syphilitic, tuberculous, rheumatic, gonorrheal, traumatic, autotoxic, diabetic, malarial and scrofulous, renal, and quiet iritis, with details following each one and the treatment of each.

A differential diagnosis between iritis and glaucoma, acute conjunctivitis and keratitis is given. A. M. MacW.

LACRIMAL APPARATUS.

Permanent Drainage of the Lacrimal Duct.—Krusius, F. (From the eyeclinic of Prof. L. Bach in the University of Marburg. *Zeitschrift für Augenheilkunde*, XXII, September, 1909, p. 230), modified Koster's method in the following manner. After slitting the canaliculus, a canula, with probe No. 2 as mandrin, is introduced into the duct. The probe is withdrawn but the canula only so far, that its lower end reaches into the inferior meatus without touching the floor. A dry piece of catgut is now inserted through the canula and by blowing the nose brought forward. A silk thread is drawn with a fine needle through the upper end of the catgut and by means of this conducted out of the nose and its end tied in a loop. The silk thread remains from 1 to 3 weeks, at the highest, as after leaving the thread longer, abscesses around the tear points have been observed. The results of this permanent drainage even in inveterate cases of dacryocystoblennorrhea were so far

satisfactory that an attempt with it may be recommended before resorting to more radical procedures. C. Z.

Canula in Lacrimonasal Duct for Twenty-Eight Years.—Worthington, Major H., Chicago (*Jour. Ophthal. and Oto-Laryng.,* July, 1909, iii, 267), reports a case of a patient who had worn a gold canula in the lacrimal duct for twenty-eight years, the canula remaining in place, without any attention, during that time and without discomfort to the patient. W. R. M.

LENS.

The Fixation of Lenses of Vertebrates, Especially of New-Born Children.—von Pfluck, A., Dresden (*Klin. Monat. für Augenheilkunde,* XLVII, II, Juli, 1909, p. 1), reports on his examinations of about 250 eyes of 36 different species of 5 classes of vertebrates with his CO_2 freezing microtome, which allows to fixate the actual form of the crystalline lens. His results corresponded exactly with those found by C. Hess and Heine by entirely different methods. For the lens of the new-born he found the following averages of dimensions: axis 3.76 mm., equatorial diameter 6.77 mm., index of lens 1.80 mm., radius of the anterior surface 5mm., radius of the posterior surface 4 mm. They correspond with those found by other authors by different methods, and show without doubt that the lens of the new born is far from approaching the form of a sphere. Corresponding to its index it comes very near the flattened form of the adult lens. v. P.'s observation of a cavity behind the equator of the lens of the monkey has been confirmed in the living human eye by Zeemann in the laboratory of Tscherning. v. P. found it also in about 50 persons with the loupe of Zehender-Westien and also in his frozen globes of the new born. C. Z.

Analysis of the Ash of the Normal and the Cataractous Lens.—Burge, W. E., Physiological Laboratory of the Johns Hopkins University (*Arch. Ophthal.,* September, 1909, xxxviii, 435). The author has been carrying out a series of investigations in order to determine what changes, if any, occur in the inorganic constituents of the tissues as a result of old

age, and in the above paper he has given the results of an analyses of the ash of normal and cataractous lenses. He describes his method of preparation of the material for analyses, the methods of analyses, and gives detailed tables showing the percentage of inorganic matter in the normal human and pig's lens, and in the cataractous lens obtained from United States and India.

The author gives the following summary:

1. There is a decrease of potassium in the cataractous lens from 38.8% of the ash in the normal to 9.8% in cataract.

2. The calcium in the cataractous lens increases from an almost negligible quantity in the normal to 12.5% in cataract.

3. There is an increase in the magnesium in the cataractous lens obtained in the United States from 1.20% as estimated in the pig's lens to 8.00%.

4. Assuming that the sodium in the normal pig's lens is about the same in quantity as the sodium in the normal human lens, then the increase in sodium is practically of the same extent as the decrease in the potassium, the sodium increasing from 6.67% in the normal to 25.06% in the cataractous condition.

5. The lenses obtained from India differ from those obtained from the United States in that they contain a large amount of calcium, potassium and possible sodium silicate, and fail to show any increase in the percentage of magnesium in the ash. W. R. M.

Investigations on the Changes of Form of the Lens During Accommodation.—Marx, E., Leiden (From the Ophth. Laboratory of the Sorbonne at Paris. *Klin. Monat. für Augenheilkunde,* XLVII, II, September, 1909, p. 280), reports on his investigations with the Ophthalmophakometer of Tscherning (the detailed description of this instrument will be found in *Tscherning's Optique Physiologique* and in *Zeitschr. für Psych. and Phys. des Sinnesorgane,* Bd. 3). M. could confirm the law, formulated by Maklakoff, a few years ago, that the thicker the lens, the less its thickness increases during accommodation. The thickness of the lens increases during accommodation much more than formerly supposed. The greatest increase of thickness found in M.'s 5 persons was

1.3 mm. in a lens of 3.6 mm. thickness, i. e., 36% in sagittal direction. M. thinks to have noticed a relation between angle alpha and the thickness of the lens, i. e., the larger the angle alpha the thicker the lens, which, however, requires further observations. C. Z.

A Fibrous Pseudo Lens Taking Its Origin from the Tunica Vasculosa Lentis.—Czermak, Prof. W., and Ulbrich, Dr., Prague. Translated by Dr. A. Braun, New York (*Arch. Ophthal.*, July, 1909, XXXVIII, 357), describe a case of fibrous pseudo-lens which evidently originated from the tunica vasculosa lentis.

The patient, aged 25 years, had an inflammation in his left eye when 3 months old. At age of 15 years he had an acute attack of pain in the same eye. Six weeks before date of examination, his left eye became inflamed and painful. Examination showed the eye ball, one-half normal size, in position of adduction. Horizontal nystagmus present. Superficial ulcerations near center of cornea. Iris atrophic, very vascular, and in shape of a funnel, at bottom of which the pupil was covered by yellowish-white membrane. Tension increased. The eye was enucleated, and the authors give the results of macroscopic and microscopic examination. Czermak concludes that it was a congenital anomaly, due to a persistence and hypertrophy of a portion of the tunica vasculosa lentis, with resorption of the enclosed lens, with the exception of a few remnants of the capsule. He gives the following reasons for this theory:

"1. The pupil is occluded by a membrane, which shows the same structure as the iris. It is undoubtedly a persistent pupillary membrane.

2. The structure is vascularized entirely by the iris. The arteries in the structure have the same appearance as the arteries of the iris.

3. At the posterior pole, a few vessels pass into the vitreous, which contains here a firm vascular net work."

A number of cases, somewhat resembling the author's case, are referred to and a bibliography is added. The article is illustrated. W. R. M.

To the Casuistics of Annular Opacity of the Anterior Surface of the Lens (Vossius). Imai, S., Yonezawa, Japan

(From the Eyeclinic of Prof. A. Vossius in the University of Giessen. *Zeitschrift für Augenheilkunde,* XXII, August, 1909, p. 126). In 1903 Vossius first described 2 cases of brownish pigmented opacity on the anterior surface of the lens which disappeared after a few weeks. V. attributed this annular opacity to the impression of the pupillary margin on the anterior capsule. I. collected 14 cases from literature, which are given in abstract, and reports in detail 3 new cases from the clinic of Prof. Vossius.

The injuries consisted in 15 cases in contusions, in 2 in perforations of the eyball. Hyphema was the most common complication, viz., in 14 cases, subconjunctival hemorrhage or conjunctivitis in 10, wound of the cornea or opacity in 7, in one case in form of stripes, in one the whole cornea was hazy, mydriasis in 5, in one irregular, rupture of the sphincter in 4, iridodonesis in 1, extravasations on the iris in 1, posterior synechiae in 2, posterior and anterior synechiae in 1, opacity of the retina in 1, hemorrhages at the macula in 1, rupture of the choroid in 3, papillitis in 1. Dislocation of the lens was never observed.

The shape and condition of the opacity of the lens varied. It was either a complete or incomplete annular opacity or a very fine circle, dotted or composed of fine lines, or a circular opaque band of different width at different places. Caspar observed in a case at first a disciform opacity which gradually became annular. This multiform opacity always lies in the center of the anterior surface of the lens and has the diameter of the normal pupil. In 6 cases it had a brownish color, similar to the rings left from posterior synechiae after dilation of the pupil, but it finally disappeared. The unpigmented ring is caused, according to Vossius, by the pressure of the iris against the capsule which produces transient degenerative changes of the capsular epithelium similar to those experimentally created by O. Schirmer in contusion cataracts which were regenerated and became invisible ophthalmoscopically.

All authors accepted the explanation of Vossius. The annular opacity disappeared in 11 cases within from 1 to 4 weeks without traces, in one after 6 weeks. V. in uncomplicated cases was finally normal. Baeck and Loehlin, in their experiments

on the effects of contusion on the lens, could not obtain an opaque ring on the anterior surface. C. Z.

Experimental Researches on the Influence of Roentgen Rays on the Lens.—Alphonse, B., Goa, India (*Archiv für Augenheilkunde,* LXIV, 3, 1909, p. 277), made his experiments on 3 groups of guinea pigs, rabbits and dogs: 1. On pregnant. 2. New born. 3. Full grown animals, with an exposure of from 3 to 90 minutes. The anatomical and histological changes are given in detail, with the following resumé: More or less degeneration of the capsular epithelium and the cortex, which was most marked at the equator and the posterior cortex. Active processes of regeneration in the epithelium of the lens with formation of cell complexes, "pseudoepithelial strata," and degenerative changes in the new formed tissue.

These typical changes may be due to damage to the epithelium and cortex as a direct consequence of the radiation. This is more marked at the equator and the posterior cortex as here probably the youngest elements are more exposed. The proliferation of the epithelia may be from direct irritation of the cells by the rays, and may be an attempt of self healing.

Roentgen rays are injurious for the lens of the young and adult animals. Exact relations between radiation and biological action cannot be established. Generally it may be said that Roentgen rays are the more detrimental the younger the cells are. It is a well known fact, that the cells of the lens up to the highest age possess the functions of growing cells with formative power, and have not only nutritive tasks. A.'s investigations confirm the pernicious influence of Roentgen rays on young cells by proving that the lens elements of the full grown animal are also subject to it.

A. further observed the inhibitory action of Roentgen rays on the growth of the eye, orbit, teeth, etc., i. e., on the young tissues. C. Z.

Further Communications on the Yellow Color of the Lens and Its Influence on Vision.—Hess, C., Würzburg (*Archiv für Augenheilkunde,* LXIV, 3, 1909, p. 293), furnished by his new observations the direct proof that (1) the perception of blue may more or less completely be abolished by the yellow color of the lens, (2) this does not require a

very saturated coloration, and (3) in much younger people the lenses are not rarely found considerably darker yellow than in H.'s patient who was 68. On the other hand, H. found the lens of a man, aged 81, scarcely more yellow than in one aged 37.

Then H. reports on his investigations on the behavior of lenses of persons and animals of different age and color, if exposed to light of certain intensity and composition. H. used for illumination a small Zeiss' arc lamp with aplanatic lens and different shades of blue glass, with the following results: The fluorescence of the lens is proportional to the yellow color of the lens, increasing with age. The almost colorless youthful lenses and the cortical parts of older lenses emit proportionally less fluorescent light. Therefore, in illumination with blue light, lenses with a yellow nucleus appear greenish, and lenses with more or less transparent, slightly bluish, cortex opaque, whereas lenses whose cortex is also yellow appear under the same illumination totally yellowish green or yellow, dull or almost entirely opaque. The fluorescent light emanating from the nucleus in order to reach the eye of the observer, must in passing through the more or less yellow cortex assume a yellow color and thus influence the color, in which the fluorescent light coming from the more peripheral strata of the lens appears. H.'s method enables us to observe objectively in the living eye the yellow coloration of the lens, the individual differences of its degree, the increase with higher age, etc.

The different absorption of different homogeneous lights by yellow lenses of different degrees may be especially well demonstrated by the following arrangement: The fresh extracted lens is placed into a glass with plain parallel walls, filled with glycerin, and this is held in front of a spectrum, perpendicularly to the direction of rays, and the lens observed in transmitted homogeneous light. By shifting the lens can be placed before the different colors of the spectrum. It is of especial interest, that the so-called cataracta nigra, which in daylight may appear dark brown or almost brownish black on a white surface, is permeable for the red rays of the spectrum. This explains that eyes with very dark lenses may still have good vision.

H.'s methods convincingly illustrate how great the differ-

ences of the perception of colors must be, which are caused by the different shades of the yellow color of lenses in different normal eyes. This is of great importance not only in painters, as H. observed before, but also in color mixers in dye works. The senescent dyers add too little yellow to the color mixtures. This is so striking towards the 60th year, that they have to give up the work. As a very fine differentiation of shades is required the employment of an illumination relatively rich in short waved rays, e. g., slightly blue colored glasses or electric arc light, is generally not sufficient. If in such cases the disturbance necessitates the loss of the position, the question may arise whether the extraction of the lens of at least one eye might not be indicated. C. Z.

LIDS.

Blepharochalasis.—Laffer, W. B., Cleveland (*Cleveland Medical Journal,* March, 1909). The author reports a case of blepharochalasis, involving both the lids and lip. Family and personal history negative. Present trouble began with a cold and sore throat three years ago. Both eyes became swollen, and since then have remained so without any change whatsoever. Skin of the upper lid has a thin, crinkled appearance, causing the lids to droop so as to almost cover the eye lashes. It is particularly swollen on the right side so as to cause the mucous membrane to hang down over the teeth when he laughs. Otherwise the patient's general health seems to be perfect. Both tonsils enlarged. The mother said they had, with the adenoid tissue, removed previously. The thyroid glands are enlarged on both sides and isthmus. Eye grounds are normal.

This case was reported because the infrequent appearance of the lips and lids at the same time. A. M. MacW.

On Ptosis Atrophica and Ptosis Adiposa. A Case of Ptosis Adiposa with Spontaneous Sinking of the Lacrimal Gland.—Weinstein, A., St. Petersburg (*Klin. Monat. für Augenheilkunde,* XLVII, II, August, 1909, p. 1909). After an exhaustive review of the incident literature the following case is reported: A man, aged 21, complained of swelling of the upper lids, which had gradually developed within the

last 6 years. The upper lids appeared thickened, hanging over and sunken. The skin of the lids was atrophic and could easily be lifted in a fold. The fold covered the ciliary border, and the adipose tissue and the lacrimal gland could be felt through the skin. The palpebral, and ocular, conjunctiva was hyperemic. The eyes teared, and, upon pressure on the lacrimal gland, a slight quantity of clear lacrimal fluid oozed.

The operation consisted in removal of a thick layer of fat through an incision, 1 cm. wide, and, on the left side, also in extirpation of the lacrimal gland. It was a typical case of ptosis adiposa, i. e., ptosis atonica (atrophic condition of the skin), complicated by prolapse of orbital fat under the skin. Thus ptosis adiposa is only a kind of ptosis atrophica. The prolapse of orbital fat is caused by the spreading of the atrophic process to the orbital septum. If the atrophic process involves also the supporting tissue of the lacrimal gland, a descensus of the gland ensues. C. Z.

MATERIA MEDICA AND THERAPEUTICS.

Experience with Sylla's Aethylmorphiodid with Comparative Studies.—Arlt, Vienna (*Wochensch. f. Therap. u. Hyg., des. Aug.,* May 20, 1909), has experimented with iodion and has found that it is much less irritating, but also much less soluble in physiologic salt solution and in distilled water than is dionin. He believes because it is less iritating than dionin that it will be prove especially useful in children. W. Z.

Experimental Investigation into the Action of Quinine Upon the Eye.—Behse, Helingsfors (*Graefe's Arch.,* LXX, April 2, 1909). The experiments were made upon rabbits. Ophth. examinations were made until the blood vessels had become very narrow and the papilla pale, i. e., had the appearance of the genuine quinine papilla. After this no more quinine was given and the animal was allowed to live some time. Microscopically the blood vessels were greatly contracted, due to direct action of the toxic agent. This contraction of the vessel walls may produce a lesion or the walls may remain unchanged. In the latter case, the contraction may relax without any harm, or very little, having resulted

to vision (benign quinine blindness). A lesion of the endothelium or the muscularis or even of the adventitia may result, in which case the membrana elastica interna ruptures and curls up between the blood corpuscles. Because of the anatomical conditions thrombi form where the arteria centrali retina enters the optic nerve and all of the serious results of this lesion follow (quinine with permanent impairment of vision). In two instances hemorrhages were found within the optic nerve trunk. In all of the cases the retina was to a greater or less degree drawn together and its individual layers were pressed together because of a general shrinking of the interstitial tissue. The principal changes were in the ganglion cells and consisted of a more or less well marked alteration and shifting of the tigroid substance in the proptoplasm. In some it had a more peripheric arrangement. In some there was fine granular degeneration and rarefaction of the chromaphiles (chromatolysis of the cells) the nuclei were consequently often eccentric with apparent extrision of the nuclear bodies. In two instances regenerative processes had already appeared. In two instances the inner granular layer the amkercrin cells were very brightly stained and contained little or no tigroid substance. The author's observations do not permit of a decision as to how far the ganglion cell changes were the result of direct action of the quinine or to a subnutritional process the result of the contraction of the blood vessels. The observations of Birch-Hirschfeld indicate that these changes may occur without blood vessel alterations as the result of the direct action of the quinine upon the ganglion cells. But the author thinks that there can be no doubt the thrombosis of the central artery, present in two of his cases, was well calculated to produce the changes in the ganglion cells. W. Z.

On Subconjunctival Injections of Perhydrol and Their Application for Ascertaining Experimentally and Anatomically the Way in Which Subconjunctival Injections Are Spreading.—Krusius, F., Marburg, and Nakazawa, T., Tokio (*Archiv. für Augenheilkunde,* LXIV, 1, 1909, p. 43), used for their experiments Merk's perhydrol. The anatomical specimens showed that the O, which developed subconjunctivally, by catalysis from the injected H_2O_2, spread directly from the subconjunctival space through the sclero-

corneal junction, not through the blood vessels, into the stroma of the iris and thence through preexisting or artificial clefts into the anterior and posterior chambers. How far this may apply to the distribution of liquids which have less force of expansion than gases, can, of course, not be inferred from these experiments. The method is of value for the microscopist, to render visible very fine preexisting cavities and to facilitate by artificial separation of tissues the study of the tectonic structure of organs. Two drawings illustrate the infiltrations of the tissues by gas. C. Z.

The Therapeutic Value of Sophol.—Bondi, M., Iglau (*Zeitschrift für Augenheilkunde*, XXI, June, 1909, p. 517). Sophol is a silver albuminate, a combination of formaldehyde-nuclein acid 80, silver 20, in masked form, i. e., the silver cannot be proven by the ordinary reagents (chlorides). Sophol is a yellowish brown powder, easily soluble in water. Since 1907 B. employed sophol as powder, but preferably in from 5 to 10% solutions, in affections of the conjunctiva with profuse discharge, especially trachoma and blennorrhoea. It is a mild, scarcely irritating, certainly not caustic bactericide which diminishes the secretion. As it does not penetrate into the depth it is only indicated as long as the microorganisms are on the surface, but if they have penetrated the epithelium nitrate of silver must be resorted to. On the recommendation of von Herff sophol as well as protargol may supplant nitrate of silver as prophylactics in the new born. In 5% solutions it may take the place of sulfate of zinc. C. Z.

On the Application of Thiosinamin in Some Diseases of the Optic Nerve and the Retina. Judin, K. A., Odessa (*Zeitschrift für Augenheilkunde*, XXII, September, 1909, p. 204), treated, with a 10% solution of thiosinamin in water and glycerin, as described by Juliusberg, in subcutaneous injections of one-third to a full Pravaz's Syringe, 20 cases, viz., atrophy of the optic nerve of tabic origin 5, genuine 8, retinitis pigmentosa with optic atrophy 2, optic atrophy after neuritis 2, acute syphilitic neuritis 1, retrobulbar neuritis 1, retinitis proliferens 1. The majority of the patients remained in J.'s treatment for from 2 to 3 months, but no improvement was noticeable. In 11 the disease progressed, in 8 it remained stationary, in 1, a case of retrobulbar neuritis due to alcohol

and tobacco, the improvement was ascribed to abstinence and the use of iodide of potassium. Obschapowaki also had negative results in 5 cases of recent corneal opacities and 18 cases of atrophy of the optic nerve. C. Z.

On Scopolamin-Morphin Narcosis in 100 Eye Operations.—Stuelp, O., Muehlheim a. R. (*Klin. Monat. für Augenheilkunde,* XLVII, II, Juli, 1909, p. 74), reports his experiences with scopolamin-morphin-narcoses, devised by Schneiderlin, in 100 various eye operations. The mixture used was scopolamin-hydrochlor. 0.0012, morphin hydrochlor. 0.03, water ad 2.00, recommended by Korff, and furnished by J. J. Riedel, Berlin, under the name "skopo-morphin" in brown glass ampullae hermetically sealed, the contents of which are injected in 3 doses at intervals of one hour. His results were:

1. The effect of the skopo-morphin injections is not always uniform and cannot be foretold. In 45% the drowsiness was complete, in 26% insufficient but useful, 29% of the injections failed or had disturbing influences.

2. The method is to be recommended, as it has decided advantages over inhalation narcosis for the operator as well as for the patient; even if insufficient it influences a subsequent chloroform narcosis favorably.

3. In general affections which may complicate inhalation narcosis, no disturbances occurred.

S. would not like to miss this method, as in operations, in which it might be dispensed with, especially iridectomy in glaucoma, complicated cataract extractions, etc., it helps by quieting the patient and insures against accidents. C. Z.

Treatment of Affections of the Eye with an Electric Bulb.—Kubota (*Wiener Medizinische Wochenschrift,* May 15, 1909).

In some cases of keratitis parenchymatosa, treatment with an electric bulb was quite successful; this was due to the heat produced by the light, and by the frequent change in the size of the aperture of the pupil. The frequent change in the size of the pupil caused the liquid in the anterior chamber to be changed more frequently. Experiments with animals gave the same results.

If some coloring substance be injected into the aural vein

of an animal, the color would appear sooner in the anterior chamber of that eye, which had been illuminated by an electric bulb. The color disappears also sooner from the eye, which had not been illuminated. J. G.

Treatment of Chronic Conjunctivitis. Abelsdorf, G. (*Allgemeine Wiener Medizinische Zeitung,* June 8, 1909).

Drugs may be locally applied, either in the form of a solution, in substance, or in the form of an ointment.

A very good base for an ointment is vaselinum Americanum album purissimum, pure, or with an addition of lanolinum anhydricum. Ointments have the advantage of having a more uniform distribution of the drug and of the fact that the action of the drug is of longer duration; their disadvantage, however, is, that occasionally they cover the cornea and disturb vision. One of the most important drugs, used in the form of an ointment is yellow oxide of mercury (½%). This drug is mainly employed in those forms of chronic conjunctivitis, in which the conjunctiva bulbi is also involved. In order to prevent unpleasant irritation, care should be taken that the mercury used be finely powdered and be protected against light.

Ichthyol zinc ointment in the strength of ichthyol 0.15 zinc oxid 5.0, vasel. Americ. 15.0 M. f. exactissime tenendo unguentum may also be used, as may a 2% Salicyl. ointment occasionally be employed, with good results. J. G.

Treatment of Ophthalmia Neonatorum with Protargol. Matais (*Wiener Klinische Wochenschrift,* August 12, 1909).

Nitrate of silver, which was, for a long time, considered the only drug useful in blenorrhoea neonatorum, occasionally produces, when used in strong solutions, complications of the cornea. Amongst the organic silver derivatives, protargol proved to be very effective. In less severe cases, 2 drops of 1:5 solution of protargol are instilled into the affected eye every 6 hours; this is done even when corneal complications exist; in severer cases the drug is instilled every 3 hours, and on the third day, the secretion is found nearly to have disappeared, and then only is a 10% solution used.

For prophylactic purposes a 20% protargol solution is to be preferred to a silver nitrate solution. J. G.

Treatment of Phlyctenular Affections of the Eye Etiologically Considered.—Schultz, A (*Weiner Klinische Wochenschrift*, June 24, 1909).

The author divides the phlyctenular affections of the eye into 2 groups:

1. Cases produced by exudation and
2. Cases produced by tuberculosis.

Cases belonging to the first group are treated with a special diet, and cases in the second group by tuberculin. J. G.

The Ophthalmo-Reaction in Typhoid.—Meroni (*Münch. Med. Woch.; Abs. Charlotte Med. Journ.*, Aug., 1909). has investigated the ophthalmo typhoid reaction of Chantemesse. The author made use in his trials of a virulent strain of typhoid bacilli cultivated in broth. The culture was treated with excess of absolute alcohol. The precipitated toxin was separated from the rest of the culture by infiltration, and dried in vacue. A solution was then made of 1 gram of this dried substance in 10 c.cm. of sodium chloride solution, and two drops of this liquid were instilled in the lower eyelid in the cases tested. A large series of experiments were performed, and the following are the principal conclusions: (1) The ophthalmo-reaction with typhoid toxin may give a positive result after six hours not only in cases of typhoid but also in other diseases; (2) after twenty-four hours the reaction is positive only in typhoid, a negative result is against the condition being typhoid; (3) the instillation of typhoid toxin produces no harmful results; (4) the ophthalmo-reaction in typhoid, though not absolutely reliable, is of practical value in diagnosis.

H. V. W.

A Case of Solitary Tubercle of the Retina, Choroid and Optic Disc, Cured with New Tuberculin Bacilli Emulsion.—Schluermann, W., Stuttgart (*Zeitschrift für Augenheilkunde* XXII, Juli, 1909, p. 37). A woman, aged 36, who a few weeks previously had recovered from kerato iritis of the left eye with V less than 5/xviii, presented the following ophthalmoscopic condition of the left eye: About 2 papillary diameters upwards and inwards of the disc was a prominent whitish grey triangular focus, 2 papillary diameters long, 1½ papillary diameters wide, with the apex towards the disc. Be-

fore and around it, immediately in front of the retina, numerous small glaring white "Drusen" were suspended in the vitreous. The blood vessels bent around the focus, the veins were congested, and some hemorrhages were found near the base of the focus. As the apex of the right lung was affected, treatment with injections of new tuberculin bacilli emulsion was at once commenced. There was also a left sided paresis of the facial nerve, increased reflexes of the right leg and slow pulse (50 to 60), headache radiating from the left eye to the back.

After the tuberculin cure was finished the focus had become smaller and V almost normal. The patient remained under observation for a year and at the last examination showed almost normal conditions, excepting connective tissue at the former focus with V = 1. Only a trace of the paresis of the facial nerve was left, the general condition was good.

The affection of the lungs was the primary focus. S. surmises, a secondary focus at the base of the brain, perhaps at the region of the pons, causing the facial paresis, increased reflexes, retardation of the pulse and headache, from which the optic nerve, retina and chorioid were infected through the intervaginal spaces.

The almost complete cure of this grave affection of the eye was ascribed to the prompt action of the bacilli emulsion; without it the eye would have been irrevocably lost. From the splendid results in this and 25 other cases S. cannot recommend too highly the bacilli emulsion in tuberculous diseases of the eye. C. Z.

New Treatment of Herpes Zoster Frontalis and Ophthalmicus. v. Arlt. (*Wiener Medizinische Wochenschrift*. May 15, 1909).

The author employed the following mode of treatment in a patient 87 years old, afflicted with a very painful attack of herpes zoster ophthalmicus. The affected parts were sprinkled three times daily with jodol; before every new application of the jodol the parts were slightly rubbed off with some ointment. The entire left half of the face was then covered with a red celluloid screen, without the screen touching the skin; after this the pain entirely disappeared.

The author is of the opinion that the beneficial effect was produced by the jodol and the red rays. J. G.

MISCELLANEOUS.

Conditions of Mal-alignment of the Cervical Vertebral and Thier Ocular Significance.—Bates, Mary E., Denver, Colo. (*American Medicine,* June, 1909). says that the cervical vertebrae have a certain amount of individual mobility, which is contrary to the usually described movements of the spine. She believes that, "Conditions of mal-alignment of the cervical vertebrae may be the consequence of a great variety of causes, and because contractions of the neck muscles impinge upon and compress the vascular and nerve supply of a great many parts and organs, they can and do, in turn, cause many adverse systemic conditions." She cites many illustrative cases, the latter series of which present varying degrees of ametropis in addition to the neck conditions. M. D. S.

School Hygiene of the Eye.—Wyler, Jesse, Cincinnati (*Lancet-Clinic,* July 31, 1909), says in an address to teachers that nearly every city of any size in Germany has systematic school examinations of the eye by experienced ophthalmologists. He emphasizes the need of the efficient co-operation of the teachers. He describes the system employed in London, of which E. Teacher Collins is at the head. The board controls two large stations out in the country about thirty miles from London, each capable of housing three hundred to four hundred children. The teacher of each class in the poor schools holds a weekly inspection, and each case of eyes which appear inflamed to the casual observer is sent up to Mr. Collins at the Royal Ophthalmic Hospital for a thorough examination every Monday and Thursday. He decides whether the disease in infectious or not, what the nature may be, and signs the papers admitting the infectious cases to one of the aforementioned institutions in the country. A visit to one of the stations is described. He explains means of conveyance of infection and warns against requiring too much close work by children. He believes term examinations should be discontinued. The author says that there should be approximately one and one-half square feet of glass for each five square feet of floor space. The danger of habit-spasm of the eyelids resulting through the imitative faculty of children is pointed out. M. D. S.

The Mechanical Factors in the Origin of the Increase in Length of the Optic Axis in Myopia.—Halben, Griefswald, (*Graefe's Arch.* LXXI-H. I., July, 1909), believes that the stretching of the posterior segment of the eyeball which produces myopia results from increased intraocular tension caused by the pressure of the extraocular muscles upon the eyeball. That there results an axial lengthening is explainable upon mechanical and anatomical grounds. He points out that there is a dense fibrous ring between the insertion of the muscles and the cornea produced by the capsule of Tenon and the expansion of the tendons. Conditions are entirely different at the posterior pole and the nerve entrance is a further weakness. Again the increased intraocular pressure cannot act upon the place where the pressure originates, consequently stretching does not occur in this area. The retroaction of the sphincter of the iris and the difference in the radius of curvature of the cornea as well as the comparative absence of elastic fibres protect the cornea against stretching. He shows that the conditions under which ophthalmos is produced are quite different. W. Z.

MYOPIA.

The Fate of Patients Operated on for Myopia. Imai Shintaro, Yonezawa, Japan, (*From the eyeclinic of Prof. A. Vossius in the University of Giessen; Beiträge zur Augenheilkunde,* 1909, Heft 72, p. 1). As there are only a few publications extant on the results of discission and extraction of the lens for the cure of myopia, after years and as such investigations are of the greatest importance for the valuation of this treatment, I. discusses the material of the eye clinic at Giessen very exhaustively. It comprises 60 myopia operations on 46 patients whose clinical histories were reported. From the numerous data, partly arranged in tabular form, the following resume is given: 1. In carefully selected cases the operation, cautiously performed, has great advantages for the majority of patients. 2. Cases from 18.00 D. on, and more, are best adapted; in myopia less than 12.00 D. the operation is not to be recommended. 3. Eyes with extensive chorioidal changes ought not to be operated on. 4. The advantage of the operation consists in an increase of visual acuity. 5. Myopia is

not permanently removed by the operation, as in the course of years a slight increase of refraction may take place. 6. Astigmatism may set in after the operation or diminish or subside. 7. The danger of detachment of the retina is not prevented by the operation, but only the detachment developing within one year from the operation can be attributed to the operation, especially if prolapse of vitreous occurred. 8. Retinal hemorrhages may follow the operation. 9. Discission is preferable to primary extraction of the transparent lens. 10. The value and result of myopia operations can be ascertained only by a later examination after several years.

A bibliography of 188 numbers is appended. C. Z.

Results of Operation for Myopia.—Vossius, A. (*Wiener Klinische Rundschau*, July 18, 1909).

The author operated on 46 patients; on 32 on one eye; on 14 on both eyes. The youngest case was 7, the oldest 57 years old; the majority of the cases showed a myopia of 15-23 diopters. Six cases were operated on with discission, sixteen with discission followed by extraction, and sixteen with primary extraction of the transparent lens. Fifteen eyes became emmetropic, thirty-seven hypermetropic, and five remained myopic 1.5-2 diopters.

The operation produced a diminution in refraction from 12 to 28 diopters. This great difference can be explained by the difference in the curvature of the corneal radius.

Twenty-six patients were examined after a number of years, and in each case a slight increase in refraction was found to be present. J. G.

MUSCLES.

The Advancement of Paralyzed Muscle for Cosmetic Purpose.—Ray, Victor, Cincinnati (*Lancet Clinic*, Sept. 4, 1909), reports a case of paralysis of the left external rectus muscle, the cause being obscure, which had the routine of iodides, mercurey and electricity for four years with no improvement. The amount of deviation when looking straight forward was 35°, which, of course, increased when looking in the direction of the affected muscle and decreased when looking away. The

writer advanced the paralyzed muscle by the Worth operation, and at the same time made a tenotomy of the internal rectus. The immediate result brought the deviation to 0° as measured by the deviometer of Worth. This result has remained unchanged. M. D. S.

Heterophoria as a Cause of Intractable Headache. Smith, E. Temple M. D., Charters Towers, North Queensland (*The Australian Medical Gazette*, July 20, 1909), gives two cases illustrating the heading of the article. The first case was that of a woman 36 years old, who had always worn spheres, was very retractible with symptoms suggesting cerebral tumor. General treatment and careful correction of her refraction gave no relief until it was discovered that she had 2° of right hyperphoria. Tenotomy of the right superior rectus reduced it to 1°, the pain persisting. A small central tenotomy of the left inferior rectus was done, but resulted in diplopia and an obvious vertical squint. Covering one eye relieved the diplopia and all its symptoms. A careful advancement of the left inferior rectus hit the happy medium and all her troubles ended.

The other case was a non-neurotic girl with severe headaches whose refraction was normal, but with the Maddox rod test was found to have 2° esophoria, and a limit of binocular prism adduction of 2½° only. The wearing of a prism of ¾°, base out from each eye, resulted in complete removal of her headaches. F. P. M.

NERVOUS SYSTEM.

Oculomotor Paralysis Accompanied by Facial Palsy, Neuroparalytic Keratitis, and Hemiplegia.—Chance, Burton, Philadelphia, (*American Journal of the. Medical. Sciences,*. August, 1909). On August 24, 1905, a negro woman aged thirty complained of sudden closure of the left eye two weeks before. It had been inflamed for six weeks. The eye was completely covered by the upper lid. There was facial palsy on the left side and the mouth was drawn toward the right. When the lid was raised the globe was seen to be rotated outward. It was deeply injected, and the epithelium of the cornea was macer

ated and steamy over nearly the entire surface. The summit was edematous and infiltrated; it stained deeply when flourescin solution was instilled. No view of the fundus could be obtained, nor could the iris be seen. Atropine suspended in oil was prescribed, and the patient was instructed to take a saturated solution of potassium iodide, beginning with fifteen drops and rapidly increasing the dose. Some improvement followed, but, by September 21 the ball remained divergent and fixed at the outer extremity. Facial paralysis was complete on the left side, and in the distribution over the superior and inferior maxillary branches of the fifth nerve there was anesthesia. The cornea continued hazy and anesthetic. About this time the patient's left arm and leg became numb and powerless. On October 12, the diagnosis of cerebral syphilis was made. On October 24, the solution of atropine was discontinued and antisyphilitic treatment continued till November 28, when signs of ptyalism appeared. Marked improvement began by the end of December. After another denudation of the cornea had occurred, the return of power was marked. The ptosis almost disappeared and the woman could walk with greater comfort. She was not seen from February, 1906 to January, 1909, in which time she was able to keep house and work as a laundress. She has had a constant dull ache over her left brow, and when overtired, she has attacks of headache, and the arm and leg feel like "pins and needles." She is very much annoyed by diplopia when she attempts to look up or down, yet even in the primary position there are two images, the left being the false one and the higher. There is now partial ptosis when at rest. There is paralysis of the superior and inferior recti, the inferior oblique, and the superior oblique muscles; the ocular excursions are limited to the extent of free adduction and abduction, while supraduction is abolished and infraduction is only faintly perceptible. The diplopia is upward. There is no accommodation power. The cornea is perfectly smooth; it is, however, anesthetic, and so is the conjunctiva. The facial movements have been regained and the face is anesthetic to pin pricks. It is probable that the hemiplegia was caused by vascular disturbance in the right side of the brain, while the oculomotor palsy arose through a disturbance at the base on the left side, in advance of the nerve fibers supplying the extremities. M. D. S.

OPERATIONS.

On Dry Operations in Ophthalmology. Prediger, Hans, (*From the eyeclinic of Prof. L. Bach in the University of Marburg. Zeitschrift für Augenheilkunde,* XXII, Juli, 1909, p. 52), describes the mode of operating at the clinic at Marburg, which aims at keeping everything dry: eye, hands, instruments, as this will best insure rigid asepsis. C. Z.

On the Treatment of Choked Disc with Trephining. Fehr, Berlin. (*From the Rudolf Virchow-Krankenhaus. Centralblatt für prakt. Augenheilkunde,* Juli, 1909, p. 197). On July 7, 1908, a girl, aged 16, came to F., on account of obscurations of the sight of both eyes lasting for minutes, vertigo, vomiting and headache which commenced a few weeks previously. The headache started back on the right side and spread over the whole head. There was occasional diplopia. Nine years ago the patient fell from a wagon on the back of her head and bled from mouth and nose, but required no treatment. Half a year later she suddenly became ill with vomiting, excitement and unconsciousness. Her physician surmised tuberculous meningitis and treated her with rest in bed and ice. After four or five weeks she recovered and, excepting occasional headache in the back, remained well up to 1908, when the above described symptoms set in.

She presented the following symptoms: bilateral paresis of the abducens, marked choked discs of 1.5 mm. prominence, V = 5/vii each, visual fields normal. Under mercurial inunctions V rose to 5/v, and the general condition was undisturbed. On July 22, headache set in, vertigo, vomiting, staggering gait, unsteadiness with closed eyes and inclination to fall backwards and to the right. Lumbar and ventricular punctures had no influence. The aspired pieces of brain substance were normal. V fell to 2/iii and the right visual field showed a considerable, the left a slight, concentric contraction. The diagnosis wavered between serous meningitis and neoplasm of the cerebellum.

On Sept. 14th a large opening was made in the skull, laying bare the traverse sinus to a large extent. The dura was bluish red and under high tension. Three probatory punctures into the right cerebellar hemisphere revealed normal brain substance. V, on Sept. 29th, was 5/xv, the visual field more contracted, no change in the choked discs.

On that day the second act of the operation followed, viz.,

by circumcision and downward reflexion of a quadrilateral flap of the dura the posterior cranial fossa was opened and the facial and auditory nerves exposed. Abundant fluid oozed, but no tumor was found. After removal of the superficial tampons the wound healed per primam. On October 2nd the paresis of abducens was better and the choked discs commenced to disappear. October 20th V = 4/xii, pupils normal, diplopia had almost disappeared, optic discs pale and their borders indistinct, the other nervous symptoms were also better.

At the last examination, on June 15, 1909, VR = 5/x, VL = 5/vi, visual field was widened, but there was marked red green blindness. The ophthalmoscopic picture was that of partial neuritic atrophy. The patient had for quite a while resumed her work as bookkeeper.

The subsidence of all symptoms excludes with certainty a cerebral tumor and justifies the assumption of serous meningitis. The case shows, 1. that in choked discs progressive impairment of sight may be arrested by trephining; 2. lumbar and ventricular punctures and trephining without opening of the dura are not equivalent substitutes for it; 3. trephining in serous meningitis may effect a complete cure. Probably the result would have been better if the operation had been performed earlier. Therefore, as already emphasized by Saenger, the beginning of failure of sight is the proper time for operation. C. Z.

A Rare Case of Magnet Operation. Hirschberg, J., Berlin, (*Centralblatt* 3, *für prakt. Augenheilkunde,* 1909, Juli, p. 193). A man, aged 38, while hammering on an iron nail, was struck by something in his left eye, on May 11, 1909. May 14 he was sent to H., who found a vertical wound 1½ mm. long, at the horizontal meridian of the cornea, 4 mm. from the nasal limbus. A small piece of the pigment layer of the iris was lacking at the nasal border. The pupil was maximally dilated, and a wound of the capsule of the lens could be clearly seen. The lens was opaque, so that an ophthalmoscopic view was prevented. V fingers at ½ m. The sideroscope indicated the presence of iron at the inferior region of the ciliary body. The application of Volkmann's and giant magnets elicited pain, but no foreign body. Five further attempts within the next 10 days were also in vain. The Roentgen skiagraph was neg-

ative. As the meridional section in the ciliary region is disagreeable on account of hemorrhages and not without danger on account of eventual later consequences, especially as the lens was opaque, H. performed, in deep narcosis, a section in the sclero-corneal junction and iridectomy. At the 3d introduction of the hand magnet a piece of iron, 1 mm. long, 0.5 mm. wide, not very thick, weighing 4 mgr., was extracted. The wound was now negative. On June 12th the patient was sent back to his physician. C. Z.

Epithelioma of the Lower Lid, with Successful Transplantation from the Arm. Jobson, Geo. B., Jr., Franklin, Pa. (*Pennsylvania Medical Journal,* July, 1909). Mr. C., a farmer, aged 66, consulted the writer for epithelioma of the middle of the right lower lid, about the size of a pea. It had previously cauterized and cureted with no improvement.

We used the electric cautery and treated it for two weeks with no results. A Chicago ophthalmologist excised the ulcer and inserted a pedicle graft from the temple. It apparently healed, but reoccured in a month, and enlarged very rapidly until it attained a size much larger than when first seen, involving two-thirds of the lower lid.

In January, 1906, we removed the lower lid, replacing it with a graft from the arm in the following manner: The eyebrow was shaved and the skin about the eye washed with green soap and Seiler's antiseptic solution, flushing the surrounding region. A local anesthetic was used, with 1/5000 adrenalin chloride solution injected around the lid. The lid was then completely removed, with the exception of a portion one-eighth inch long at each canthus, which were used to give anchorage to the graft, preserve the punctum and lacrymal canal and the angle of the lids. Bleeding was checked by hot compresses, the denuded surface was cleansed with physiologic salt solution and covered with gauze.

The graft was taken from the inner surface of the arm midway between the axilla and the elbow. It was placed in a physiologic salt solution to keep warm and moist. The flap was sutured to the fornix and tarso-orbital fascia by three stitches of black silk. The extremities were anchored loosely to the canthal portions and the lower edge was attached to the

skin of the malar region. The wound was dressed with sterile vaseline, and covered with perforated rubber tissue. A compress of gauze with cotton and a bandage completed the dressing.

The stitches were removed on the eighth day. This case was reported two years and nine months after the operation and was accompanied by a photograph. A. M. MacW.

Operations on the Globe in Presence of Chronic Dacryocystitis.—Taylor, S. Johnson, Norwich, Eng. (*Ophthalmic Review*, Oct., 1909). The writer points out that the modern plan of thoroughly dissecting out the diseased lacrymal sac before performing any operation upon the eye in which the globe is opened is the one to be adopted in the vast majority of cases. But this procedure may, at times, be undesirable, especially in old, decrepit patients. In such examples the writer has successfully adopted the plan of ligating the upper and lower canaliculi.

The parts are well cocainised, some powdered cocaine being applied, a fine probe is passed into the canaliculus and held by an assistant or nurse against the wall of the nose; then a small, well-curved needle, armed with a double silk ligature, is passed under and around the probe, taking a little more tissue than the canaliculus only, whereupon the probe is withdrawn and the double ligature firmly tied; the same is done to the other canaliculus and communication with the sac is thus entirely shut off, as can be proved by there being no regurgitation of pus when pressure is made over the sac.

Immediately after the ligatures have been applied, the conjunctival sac is well washed out with sublimate solution and the cataract operation proceeded with. To prevent mydriasis as a result of the cocaine, the writer instils a little eserine a few minutes before the use of this anesthetic. It is as well, also, to pass the needles rather near the puncta to leave plenty of room for the repetition of the procedure, should needling of capsule be subsequently required, as occurred in one of my cases. Very little reaction follows the application of the ligatures, the dressings and after treatment are not in any way modified; the ligatures often cut out or can be removed a few days after insertion, long before which especially if a con-

junctival flap is secured the wound in the globe is healed and free from risk of infection. C. H. M.

Re-attachment in Iridodialysis: A Method which Does Not Incarcerate the Iris.—Jameson, P. Chalmers, Brooklyn, N. Y. (*Arch. Ophthal.*, July, 1909, XXXVIII, 391), presents a new method of operating for the cure of iridodialysis. The author gives the objects of the operation as follows:

"1. Re-attachment of torn iris as near to its normal anatomical position as possible.

"2. Re-attachment to a fresh surface within the anterior chamber without incarceration.

"3. Simple, accurate, and practical technique."

The first is accomplished by making the necessary incision into the sinus of the anterior chamber well back from the limbus. The second by bringing the torn iris against a linear incision within the anterior chamber, *not between its lips*. The third by the introduction of sutures before incision is made into the anterior chamber, and by impinging the iris against the resistant posterior surface of the cornea the iris is neither torn in the effort to perforate it nor lacerated by forceps.

A description of the operation is given, and four cases reported. W. R. M.

OPTICS.

A Plea for Unanimity in the Estimation of Visual Acuity.—Haass, Viersen (*Wochensch. f. Therap. u. Hyg. des Aug.*, August 8, 1909), discusses the report of the Commission appointed at the Luzerne Congress. They recommend the optotype and two tables of these characters arranged in arithmetic progression: O. 1, O. 2, O. 3, etc. They also admitted tables of Arabic figures. H. calls attention to the fact that 5/x vision by the old method and 5/x V. by the present method are not the same and comparison of V. for the same patient can only be made with the same type. It is the hope of the author that in time V. will be determined by optotypes.

W. Z.

Illumination for Homework of School Children.—Struben, E. D. (*Doctorate thesis*), concludes from the litera-

ture, that the poor illumination of the schoolrooms, as a cause of the school myopia, has been exaggerated. However, the conclusion may not be drawn that poor illumination in general has little influence for the beginning and progress of the myopia. The possibility exists that near-work outside the school with poor illumination contra-acts entirely the benefit of the better light in the schoolroom.

The eye appreciates the equal illumination of two surfaces in contact; after some exercising the exactness can be brought up to about 1 per cent. As protometer the well known one of Weber was used with some modifications, a prism after Lummer-Brodhun was used, so that looking through the ocular and round field illuminated by the surface examiner, surrounded by a ring illuminated by the flame of the photometer was seen. In this way smaller differences of illumination are recognized. And the length of the flame is controlled after the method of Hugo Krüss. As the different samples of petroleum give different readings of the constants, amylacetat was used. The instrument is not handy. For practical purposes Wingen's Helligkeitsprüfer was tried. This apparatus is quite exact; it is suitable for the purpose of quick determination of which places have more which less illumination than a certain number of meter candles but it cannot be recommended as a measuring instrument. Wingen improved his instrument and his newer Beleuchtungsmesser, which has a constant flame and is a good measuring apparatus. It needs gauging of the outwardly visible scale and the petroleum flame must remain the same. Without ocular and chimney it has the size and weight of a hand camera and costs 60 marks ($15.00). The examination goes much quicker than with Weber's. The lamp is lit and burns steadily after a few minutes, the point of the flame is carefully put at the height of the gauging-line and equal illumination of the two cartons is made by looking through the ocular, first through the red, then through the green glass. Without computation the amount of meter candles can be read off. The smoke-glasses must be controlled beforehand. It cannot be used for measuring below 10 meter candles. The greatest objection is the use of petroleum, as different samples give a different illumination.

A hygienical good illumination must fulfill the following

conditions: 1. The quantity of light, which falls on the work, must be sufficient and no shadows must fall on it, so while writing it must not come from the right side neither from behind. 2. The light must not be dazzling. 3. The flame must be quiet. 4. The flame must produce as little products of combustion as possible, which vitiate the air of the room. 5. The production of heat and its radiation must not be too strong. 6. The light installation must not be dangerous for health or life. The last three conditions are outside the consideration of this work. Restless flames are not found more prejudicial for the eye than those illuminations, where the person is badly adapted for his work and those, which remain below a certain number of meter candles. Among the first class are those, who by looking up, see the flame. Everywhere the adaptation is bad, where the lamp is before the working person, as in the middle above the table, where one works. Piekema has investigated the connection between vision and illumination and found that the vision rapidly increases to 10 meter-candles, very slowly from 10-50 M. C. and not more over 50 M. C., for white light. He considers 10 M. C. in general, 15-20 M. C. for fine work sufficient. Struben can not agree with the last sentence. He thinks that the provision-coefficient 25 of Katz is too large; a much smaller one will suffice, if we rest the eye relatively longer, so that the restoration-apparatus gets an opportunity to functionate. Thus follows, that in an illumination, at which each eye (and also eyes with refraction-anomalies) has its maximal visual acuity, is sufficient, if exertion changes suitable with rest. From the practical standpoint Struben considers, that as the work at home for school children does not require more than vision 1, and this is reached by emmetropes with moderately good adaptation—well below 25 M. C., an emmetrope will have with 25 M. C. sufficient provision, which allows him to work without too many intermissions. With poor adaptation and fine work and a less favorable condition of the eye or through refraction-anomaly or through corneal opacities the illumination must be more powerful or the intermissions must be longer. Otherwise the object is brought nearer to the eye and the causative factor for myopia is born.

Struben made 101 determinations, 55 by the well-to-do and

46 by less favored ones; 14 families of the 55 used electric light and 41 gas; of the 46 others 19 used petroleum and 27 had Auer light. With the well-to-do the consumers of electric light were in less good conditions than the gas consumers. Only in the study-light the electric light can compete with the Auer light. On an average the illumination with the less favored ones is as good as the average electric illumination of the well-to-do, somewhat less than the average gas illumination of this class of people. The illumination of petroleum is generally poor; this makes the average illumination below 25 M. C.. In 63 cases (62.4 per cent.) the conditions were found acceptable. At least 37.6 per cent. were found with insufficient illumination at home; of the 14 cases of electric illumination 7 were insufficient and of the 19 cases of petroleum illumination 11, and of the 68 cases of incandescent gaslight 20 were insufficient. Struben considered poor light, when it remained below 25 M. C. and the illumination does not allow a good adaptation, even if above 25 M. C. and when it comes from the right, also even when above 25 M. C.

E. E. B.

The Effect of Ultraviolet Rays Upon the Eye.—Schanz, Karl Fritz, Stockhalser (*Weiner Klinische Rundschau,* June 13, 1909).

The Ultraviolet rays of the sun act upon the eye in the same manner as upon the skin.

In climbing high mountains, which are covered with snow, there appears not only an inflammation of the skin, but also an irritation of the conjunctiva and this may progress to snow-blindness.

Experiments with animals showed that frequent illumination of the conjunctiva with light, very rich in ultraviolet rays, produces a condition similar to spring catarrh. J. G.

The Effect of Ultraviolet Rays Upon the Eye.—Schanz and Stockhalsen (*Weiner Klinische Wochenschrift,* Aug. 26, 1909).

Ultraviolet rays produce erythropsy and electric ophthalmia. There is a tendency to constantly increase the intensity of the light by this amount of ultraviolet rays, and the injurious effect of artificial light is also increased.

Common glass, out of which the eyeglasses and lamp-globes are made, absorb only the very short rays (0-300 u. u.); these rays, however do not penetrate the eye; they produce only irritation of the external parts of the eye. Rays of 300-350 u. u. in length are absorbed by the lens; rays 350-400 u. u. long cause flourescence of the lens and reach the retina.

The authors were able to make a glass (euphoglass) which absorbed all ultraviolet rays up to 400 u. u. and the visible spectrum became dimmer only 5 per cent. J. G.

Amber Glasses at the North Pole. Cook, Frederick (*Seattle Times*, Sept. 26, 1909). Dr. Cook, "alleged 'discoverer' of the North Pole," in his narrative said in regard to the effect of polar light on the eyes, etc.:

"Though the heat of the sun was barely felt, its rays began to pierce the eye with painful effects. A bright light being reflected from the spotless surface of the storm-driven snows could not long be endured even by the Eskimos without some pain. The amber-colored goggles that we had made at Annotook from the glass of the photographic supplies now proved a priceless discovery. They effectually removed one of the greatest torments to Arctic travel.

The darkened or smoky glasses, blue glasses and ordinary sunward automobile goggles had all been tried with indifferent results. They failed for one reason or another, mostly because of an insufficient range of vision or a faulty construction, making it impossible to proceed more than a few minutes without removing the accumulated condensation.

This trouble was entirely eliminated in our goggles. The amber glass screened only the active rays which injured the eye, but did not interfere with the range of vision. Indeed, the eye, relieved of the snow glare, was better enabled to see distant objects than through field glasses. It is frequently most difficult to detect icy surface irregularities on cloudy days. The amber glass also dispels this trouble perfectly, enabling the eye to search carefully every nook and crevice through the vague incandescence which blinds the observer in hazy weather. The amber glass therefore reduces not the quantity of light as do smoky glasses but the quality. We were not only relieved of the pain and fatigue of snow glare, but the amber color gave a touch of cheer and warmth to our ever

chilled horizon of blues. The usual snow goggles add an ugly gray blue to the frozen seas which alone sends frosty waves over the nervous fibers.

So thoroughly were we in love with these goggles that later they were worn while asleep with the double object of screening the strong light which passes through the eyelids, and also to keep the forehead warm." H. V. W.

OPTIC NERVE.

The Complicated Hereditary Family Atrophy of the Optic Nerve in Childhood.—Behr, C., (*From the eyeclinic of Prof. L. Heine in the University of Kiel. Klin. Monat. für Augenheilkunde* XLVII, II, August, 1909, p. 138), observed in 6 boys, from 3 to 13 years, a peculiar complex of symptoms, so far not described, and reports the clinical histories in detail. It consists of bilateral, chiefly temporal, atrophy of the optic nerve, respectively optic neuritis, central scotomas, severe visual disturbances, almost equal in both eyes, in severe nystagmus and ocular palsies, slight spasms and increased reflexes in the limbs without pareses, slight ataxia, uncertain staggering gait, weakness of bladder and some mental inferiority. This complex of symptoms, which as far as the eyes are concerned, is in conformity with the family atrophy of the optic nerve of Leber (of which 4 cases occurring in 2 pairs of brothers are reported), develops in the first few years of life or is congenital, remains stationary for many years and has so far been observed only in boys. The eye symptoms are by far the predominant feature of the clinical picture. In order to emphasize the independence of the complex to Leber's family optic atrophy, B. proposes to name " complicated infantile family optic atrophy" and for the other "uncomplicated juvenile family optic atrophy." C. Z.

Trephining in Choked Disc.—Fehr (*Weiner Medicinische Wochenschrift*, July 3, 1909).

A patient was suffering for weeks with headache, dizziness, nausea, diplopia; objectively: paresis of the abducens and choked disc. Several punctures of the ventricle were performed without any beneficial results. Later the left occipital bone was trephined, and a deep incision into the cerebellum was made; this

followed by rapid improvement; the paresis of the abducens disappeared; the swelling of the papilla was diminished, and vision in the right eye was 1/vi; in left 1/iv.

The writer expresses his opinion that he had to deal with a case of chronic meningitis which was improved after operation. J. G.

Palliative Trepanation in Papilloedema.—v. Hippel. Heidelberg (*Graefe's Arch.* LXIX-H. 2, Nov. 9, 1908), from a study of the literature of the subject v. Hipple has formulated the following: 1. Palliative operations are so considered when performed either when a suspected growth was found for any reason to be irremovable, or where the original intention was to relieve intracranial tension.

2. The operation (including osteoplastic) in the vast majority of the cases brought about a recession of the papilloedema, either for a long period or during the existence of the case.

3. It is absolutely necessary for the retention of vision to operate early. Many of the reported cases have been operated upon too late.

4. Tumor symptoms (papilloedema) in a considerable number of cases occurs where there is no tumor (chronic hydrocephalus, pseudotumor, swelling of the brain, serous meningitis). In such cases early operation may bring about permanent, complete cure, while if delayed or not performed early enough, blindness can result.

5. In true tumor the period of life after trepanation is such that in many of the cases the result is to be considered in this respect satisfactory, especially as the associated brain tumor symptoms are usually relieved.

6. The danger of the operation is on the whole not to be too lightly considered.

7. As papilloedema in a large number of cases of brain diseases is an early symptom whereas in other diseases it occurs relatively late it would appear that the danger of death from operation is less where vision is still useful and no definite localizing symptoms exist. These are however just the case in which the ophthalmologist is called upon to suggest the opportune operation.

8. The immediate danger of the operation can by proper technique be greatly lessened. To be considered under this

head are the use of chloroform, not ether two stage operation, cocainizing the dura, avoidance of escape of large amount of fluid, careful complete closure of the wound with weichteilnaht, avoidance of the use of the hammer and chisel in opening the skull. Avoidance of the ostoplastic method.

9. Trepanation is the most suitable procedure. The bone should always be removed and never replaced.

10. A permanent considerable reduction of intracranial pressure can be obtained in a number of cases without opening the dura, but in a majority of cases this is insufficient and the dura must be removed. In the two step operation the effect on the papilloedema and visual function in the first few days may serve as a guide as to the necessity of the removal of the dura.

11. At times hernia of the brain is a necessary consequence and is not to be prevented but controlled.

12. When localizing symptoms are absent the right temple is the site of election for the operation.

13. Notwithstanding care in the technique and in the choice of cases, where something is to be hoped for in vision, it is impossible in all cases to prevent death and an unfavorable influence upon the visual function. The latter in early operated cases is rare. The number of deaths are certainly far fewer than Bergmann's statistics of intentional or unintentional palliative trepanation give.

14. Because of the undoubted slight danger it would be a mistake to be too enthusiastic over the results. It is a duty to inform the relatives of the possibility of an unfavorable result.

15. It is a duty in the beginning of reduction of vision through papilloedema to advise operation as: (a) without it blindness is almost certain to result; (b) the prognosis for vision is relatively good; (c) life is more often prolonged than shortened and is made more bearable; (d) in case of operative death the patient is saved from a miserable existence.

16. Lumbar puncture when a tumor is likely present is not generally of value. In tumors of the cerebellum it is valueless. In other processes, especially when repeated it may have a favorable influence on the papilloedema and as it is harmless it is to be tried first.

17. Ventricular puncture may act favorably and in disease

with intracranial hypertension, as meningitis serosa, may be curative.

18. It is to be hoped that when Neisser's diagnostic brain puncture obtains general employment a marked increase in operable brain tumor cases will result and a corresponding decrease in palliative trepanation.

The author takes up the question of the cause of papilloedema. Considering the question—Is it due to primary interstitial neuritis and perineuritis with secondary inflammatory oedema? He shows that the result of trepanation without opening of the dura can cause an almost immediate subsidence of the swelling. He says that it does not seem possible that a high-grade inflammation could be rapidly cured if the toxin still acted in a lessened amount upon the nerve. Again, a large number of anatomical investigations show that there may be an entire absence of changes.

Against a primary inflammatory nature of the papilloedema are the following objections: that other symptoms which accompany increased intracranial pressure subside with the subsidence of the papilloedema. The presence or absence of ampullae is of little value in settlement of this question as they have been found present in one optic nerve and absent in the other in the same case.

He believes that one can in general consider increased intracranial pressure with its accompanying angestive effect upon the blood and lymph as the primary cause of the papilloedema without assuming that it must always bring it about in exactly the same way. It might result from compression of the cavernous sinus or of the vena centralis at its perforation of the dural sheath; or in consequence of a vaginal edema the result of the progress of cerebral edema; or from a swelling of the brain tissue in the sense of Reichardts. W. Z.

ORBIT.

On Exophthalmus in Malformation of the Skull.—Redslob, E., Strassburg (*Klin. Monat. für Augenheilkunde* XLVII,II, Juli, 1909, p. 31), reports in detail a case of scaphocephalus in a boy, aged 8½. The characteristic features were a very elongated skull, steep, high, overhanging forehead, the occiput projecting like a cyst and depressed towards the neck.

an annular indentation behind the cornary region, a ridge running on top of the head forming the edge of the angle between both parietal bones, ossification of the sagittal suture. Scaphocephalus, which was here complicated with clinocephalus, is a very rare deformity of the skull, much rarer than oxycephalus (dome-shaped skull). According to the recent researches of Backmann it is due to premature synostosis of the sagittal suture. The skull remains narrow, the brain grows only forwards and backwards and causes the frontal and occipital prominences, its expansion upwards being prevented by the premature synostosis.

From the history of this case R. inferred the existence of a secondary hydrocephalus in early childhood which explained the exophthalmus. The hydrocephalic fluid bulged all parts, which could not be extended by the brain, viz.: the orbital roof, the posterior orbital wall, large wing of the sphenoid, and the squama of the temporal bones. This caused the exophthalmus and atrophy of both optic nerves, V = 0.7. Atrophy in scaphocephalus has also been described by Enslin and others.

The condition is illustrated by photogravures en face and profile, and the exact measurements of the dimensions of the skull are given. C. Z.

PATHOLOGY.

Some Histologic Findings in Preretinal Hemorrhages. —Klauber, Vienna (*Graefe's Arch.* LXX-H. II, April, 1909), examined the eyes of a woman, histologically, who before death had had in both eyes extensive preretinal hemorrhages. Macroscopically and histologically the points of interest were, the size of the marginal effusion, the inclusion of the papilla in the extravasation, a system of regular circular retinal folds, the extensive rupture into the vitreous. The extravasation was not limited to the seat of predeliction of this type of hemorrhage, but included the region of the papilla and apparently all of that portion of the fundus visible by the indirect method. This extensive outpouring must have occurred within 4 days. The circular folds are to be explained by supposing an interruption in the leakage.

The author's findings confirm those of Benedek as to the location and origin of preretinal hemorrhages. They are lo-

cated between the limitans interna and the remaining layers of the retina. The finding of numerous hemorrhages in the different layers of the retinal some of them transitional preretinal, confirm the belief that they differ in no important way etiologically from retinal hemorrhages but that only a relative difference exists between intraretinal and preretinal hemorrhages. W. Z.

On the Occurrence of Opsonins in the Aqueous Humor.—Knapp, Arnold, New York (*Arch. Ophth.*, July, 1909, XXXVIII, 372), has been experimenting, for the last three years, to determine the opsonic power of the aqueous humor under certain conditions. Experiments were made with immunized and normal rabbits, and the amount of phagocytosis which had taken place was determined. In comparing results, repeated study of microscopic specimens showed that phagocytosis (1) is less in salt solution than in normal aqueous; (2) is more marked in immunized aqueous and then is about equal to that found in normal serum; (3) is still more marked in the second normal aqueous, though most pronounced in the immunized blood serum. W. R. M.

Keratitis Profunda Scleroticans Tuberculosa.—(*Wemmerslager van Sparwoude. C. G.*) (doctorate thesis) wishes to distinguish the cases where the substantia propria corneae is affected in Keratitis propria. This includes Keratitis parenchymatosa through hereditary syphilis; those less typical forms of keratitis, which are accompanied generally with scleritis, iritis and cyclitis and are considered more and more to be due to tuberculosis; in some cases isolated foci are found, which heal under proper care, in other confluating foci, which creep on and show connective tissue formation with vessels; keratitis scleroticans. A next sub-group forms the much rarer keratitis disciformis, which is caused by primary superficial lesions (herpes, trauma, vaccinola). Next to this keratitis propria we distinguish keratitis superficialis and on the other side the inflammations of the membr. Descem. or its endothelium. To this last group belongs the ulcus corneae posterior described by von Hippel, which is caused by a deep seated process, which harms the membr. Descem. Of the same kind, but much lighter degree the leucocytic conglomera-

tions belong, which form with cyclitis and some forms of iritis on the endothelium and which, if they remain longer and increase do disappear the endothelia. Formerly one spoke here of keratitis punctata (profunda). It would be better to use this name for cases with little circumscript inflammatory foci in the deepest layers of the cornea just before the membrana Descemii, and which show mostly also at the other side of the membrane a little pile of leucocytes. This form is seen sometimes in the beginning of a hereditary leutic keratitis, more often as a complication of an irido-cyclitis or cyclitis of a scrofulous patient, which is now considered to be tuberculous. Another clinical form is distinguished by the coalescence of the foci and advancement in the cornea, restricted within the deepest layers. When these foci are vascularized and have become changed in connective tissue one may call this form of keratitis scleroticans profunda. Three such cases are examined histologically in this thesis. Herbert Parsons gives in Vol. 1 of his Pathology of the Eye an indistinct photo of a case examined by Hancock; Reis communicated a perhaps still purer case in the 34th Versammlung zu Heidelberg.

The 19-year-old patient came with double scleritis and iritis with a papillitis of the right eye in the Amsterdam university-clinic. The right eye had been sick since half a year, the left one only shortly. The scleritis of the left eye healed under proper care after seven months without one drug having shown a typical influence; the cornea had been only temporarily affected, the iris never. The right eye showed with the scleritis and iritis an inflammation in the deepest corneal layers with new formation of membranes, which seemed to lay at the posterior surface and to originate from the temporal and nasal side of the corneal margin growing centripetally. The tension was continuously subnormal. While the left eye healed, the membranes here pushed forward until they touched and nearly the entire posterior surface of the cornea was covered. After a period of relative rest the eye became restless and was at the end enucleated. Histologically the ciliary body was nearly normal; its slight changes seem of subordinate importance and of later date. There was also found scleritis, keratitis profunda, iritis and neuritis N. optici. The papillitis is secondary to the scleritis, described by Van den Borg, consecutive to poisons pro-

duced in the anterior part of the eye, which are evacuated through the vitreous body along the optic nerve. The scleritis is primary to the iritis and the keratitis. The scleritis was characterized by rarefication of the scleral tissue, dilatation of the vessels, infiltration along the vessels and spoolformy infiltration between the fibre-bundles, which contain nests of proliferating endothelia and giant cells. W. considers these giant cells, which he calls nuclear nests, originated from the vessels; they are placed in the tissue as vessels are found in other parts of the specimens, as well in the sclera as in the subconjunctival tissue at the cornea-scleral margin; also the proliferation of the endothelium cells in some vessels and vessel walls, the distribution of the nuclei in some nuclear nests, the ramification of some giant cells and lastly the transitions of a capillary in giant cells demonstrate this interpretation with very great probability. All nuclear nests of sclera, conjunctiva and cornea without exception are so situated, that they can be derived unconstrained from pre-existing vessels through closure of the vessels, proliferation of the endothelia of intima and adventitia and hyalin degeneration of the intermediate tissue. In the cornea the same changes exist as in the sclera and conjunctiva, only we find layers. In the deepest layer of the cornea we find the product of expired process: old connective tissue; the anterior part of the diseased corneal part shows the first beginning: vessel formation. W. represents himself the following changes to have happened: First, after formation of new vessels, infiltration around the new vessel, then serious infiltration, thrombosis followed by formation of neuclear nest and giant cell, then infiltration around these nuclear nests going to formation of granulation tissue, which grows to connective tissue. Where now directly over the Descem. membr. full-grown connective tissue, primarily from out the inflamed scleral vessels have grown in the cornea, surrounded by a small infiltration. This infiltration zone grew until a thick coat of leucocytes formed. Closure of the vessels stopped the development and the organization began from out the surrounding connective tissue. In the meantime new vessels grew in the bordering more superficial layer, where the same process began. We suppose some infection to be the cause, which started in the sclera and went from there into the cornea. Tuberculosis is most probable, although no cheese is found and tubercle ba-

cilli have not been demonstrated. But fibrous tubercles are known without cheese and much connective tissue formation, and tuberculous giant cells are found to originate from out vessels. Moreover, bacilli in the eye strain difficultly and the patient reacted typically after tuberculin injection.

Clinically it looked as if a new membrane grew over the posterior layer of the cornea, although this membrane was found in the deepest layers of the cornea. Some proliferation exists upon the posterior surface of Descemet's membrane, but it is little and only of greater importance near the angle of the anterior chamber. This seems to depend on a local tear of the Descemet's membrane. The tension was constantly low, although the ciliary body, which is considered the source of the aqueous humor, is intact and the angle of the anterior chamber is closed by the infiltrated iris.

The 22 years old patient came in the clinic with a red, very painful and light shy eye, having old maculae corneae with irregular astigmatism. The lower two-thirds of the cornea are nearly opaque, partly through a recent swelling, partly through old opacities in the deepest layers and deep vessels. Many tuberculous lymphomes and cicatrices in the neck. After full dilation bluish connective tissue in the deepest corneal layers was seen, before which strong sinuous vessels: the picture of an ended keratitis scleroticans. After many remissions the eye had to be enucleated a year later. Patient had reacted on tuberculin injections. Sometimes attacks of redness and pain came without new eruptions of infiltrates, so that such eruptions in the sclera or ciliary body were suspected. But only slight changes were found in the uvea, neither inflammatory symptoms were found in the posterior part of the eye. The thickness of the cornea was irregular: the lower part of its horizontal coupes show much stronger symptoms of chronic inflammation than the higher ones. Only the posterior fourth part is swollen, with the same layers as in Case 1, only the infiltration layer is often absent, because the process has healed over a large extent. In the infiltrates giant cells and a necrotic spot are found. The process must have started below. There, in the sclera are only found enlarged and multiple vessels. The disease may have healed here. From here the tuberculous agents must have gone in the cornea and become independent.

Case 3. The 32 years old patient suffered with her right

eye since 2 years, with her left one ½-year. As a child she suffered with her eyes, 18 years old glands were removed from her neck. Since 3 years headache and emesis, since 6 weeks red patches on the extremities and neck (Erythème induré des jeunes filles Bazin and folliclis, which is a tuberculous process). The eye right has conjunctival injection, the cornea is diffuse opaque, at the temporal side sclerotic tissue in the deep layers before which newformed vessels, which go over the middle, to the nasal side large Descemet spots behind the edematous swollen cornea, in the middle chalk-white maculae. The pupil became wide under atropin, with a synechia to the nasal side; hardly any light from the fundus. Vision 1/lx. In the left eye a large scleral infiltrate down to the temporal side, the cornea was less opaque, mostly below to the temporal side, where some deep vessels penetrate the cornea. The entire cornea is slightly edematous, in the deepest layers grayish flakes of exudate, which correspond with Descemet spots. Half a year later the right eye had to be enucleated. In the next year the left eye showed symptoms of a progressive inflammation, scleritis and keratitis, which healed regularly under tuberculin treatment. As in the other cases the cornea shows layers, which from fore to backward show new formation of vessels, then infiltration, then new formation of connective tissue. The infiltration is here not so strong, as the process showed an inclination toward healing. The young connective tissue looks as granulation tissue, wherein nuclear nests with giant cells. These numerous nests have a round section surrounded by granulations. Nowhere cheese formation, neither necrosis. The ciliary body is normal. The iris is entirely infiltrated, probably through resorption of poisons from out the cornea. The sclera shows very little fresh inflammation, but its atrophy and remaining vascular changes demonstrate, that a serous scleritis had preceded.

E. E. B.

PHYSIOLOGY.

A Clinical Contribution to the Question as to Constant Free Communication Between Anterior and Posterior Chambers of the Eye.—Winselmann, G., Bremerhaven (*Klin. Monat. für Augenheilkunde* XLVII, II, August, 1909, p. 203). C. Hamburger proved experimentally that nor-

mally there is no free communication between anterior and posterior chambers of the eye, but a physiological closure of the pupil, and that the secretion of the aqueous is chiefly furnished by the anterior surface of the iris, not the ciliary body. This view is still being opposed by Leber. W. thinks that his observation may contribute to the decision of the question: The right eye of a laborer was struck, 5 hours previously, by a piece of iron, of the size of about 1 ccm. Except slight swelling and sugillation of the upper lid there were no external signs of injury on the eye. The pupil, as large as the left, reacted well, and the aqueous was perfectly clear. V. less than 5/lx. Ophthalmoscopically the temporal portion of the pupil gave a red reflex, the center and the nasal portion remained dark. Ten minutes after instillation of 1 per cent. eumydrin the upper nasal portion of the pupil commenced to dilate. At the same moment a drop of sanguinolent fluid appeared under the upper nasal pupillary margin and slowly flowed downwards in a red streak, followed by a second and third, which formed, within a few minutes, a small hyphema at the lower sinus. Five minutes later the remaining portions of the pupil were dilated and soon the whole aqueous showed a bloody color, until after 15 minutes it cleared up and the hyphemia filled about the lower third of the anterior chamber.

This process resembled very much the experiments of Hamburger who injected flourescin into the posterior chamber. This did not appear in the anterior chamber even after 30 minutes, but immediately after puncture of the anterior chamber or after intense dilation of the pupil after the animal was placed in the dark.

In W.'s case the traumatism had caused hemorrhages in the vitreous and posterior chamber. The blood was retained in the posterior chamber without producing the slightest coloration of the aqueous. At the moment the pupil became dilated blood oozed from the posterior into the anterior chamber at the point, where the dilation of the pupil commenced.

W. thinks the only explanation possible was that the anterior chamber was so firmly closed against the posterior chamber, that no blood could pass through, and sees in his observation a confirmation of Hamburger's assertion. C. Z.

Coloring of Eyes in Vivo for Physiologic or Diagnostic Purposes.—Hamburger, C. (*Weiner Klinische Wochenschrift,* August 26, 1909).

Uranin (flourescein) which can be dissolved in warm water, when administered by mouth produces icterus; the coloring of the skin disappears after a lapse of 8 to 24 hours; the solution may be taken in coffee with sugar, adults can take 6 to 8 gms.; children 2 to 5 gms.

This substance enters a healthy eye in very small amount, only after a lapse of 3 hours whereas a diseased and inflamed eye becomes sparkling green in a very short time. The more intense the inflammation the brighter is the coloring of the liquid in the anterior chamber; only a real intraocular inflammation shows the entrance of the coloring substance into the anterior chamber; ordinary conjunctivitis cannot accomplish this. (See also p. 110, Vol. vi., No. 1.) J. G.

Psychology of Reading.—Huey, E. B. (*Dioptic Review*).

As a beginning of the analysis of reading, it seemed important to obtain a definite description of the work of the eye. For this purpose I arranged the apparatus as follows: A little plaster of paris cup was molded to fit the cornea accurately and smoothly, sandpapered until it was very light and thin, and placed upon the front surface of the eye, the cup adhering tightly to the moist cornea. No inconvenience was felt as the corneal surface was made insensitive by the use of a little holocain, or sometimes cocaine. A round hole in the cup permitted the observer to read with this eye, and the other eye was left free. A light tubular lever of celluloidin and glass connected the cup to an aluminum pointer, flat and thin, which responded instantly to the slightest movement of the eye; and, suspended over the smoked paper surface of a moving drum cylinder, the aluminum point traced a record of the eye's movement as the observer read. The diagram shows the arrangement in the earlier and simpler form.

The observer's head rested in a frame, which was arranged to prevent movements that would interfere with the record and which held an attachment to prevent the eyelids from interfering with the cup. The weight and friction of the recording apparatus was reduced to a minimum, the weight of all the parts moved by the eye being but a little more than

half a gramme, while the weight resting directly upon the eye was less than one-seventh of a gramme. During the reading the reader was usually quite unconscious of there being an attachment to his eye, and the reading proceeded as glibly and easily as could be desired.

Records were made from a large number of readings, with various lengths of line, sizes of type, distances of reading matter, etc. Sometimes the reading was at normal speed, sometimes as fast as the reader could possibly read. The apparatus seemed to work equally well under all the various conditions, even when the speed reached an average of twelve words per second.

In order to measure the speed, an electric current from an induction coil was passed through the pointer to the drum. This current was interrupted at very regular short intervals by the vibration of an electrically driven tuning fork, the snap of the spark from the pointer's tip thus displacing a dot of soot on the paper record of each interruption. As the pointer flitted over the drum during the reading, a tracing was then produced. The tracing magnified the actual movement several times.

The tracings showed that the eye always traversed the page line by line, and always in a succession of quick movements and pauses when moving from left to right. Movements in retraceal occurred but seldom, averaging about once in seven lines. Apparently the eye did not wander far above and below the line that was being read, although the arrangement of the apparatus could not show this certainly. Professor Javal thought that the eye's fixation point moved along the line between the middle and top of the small letters, but I do not think that his experiment with after-images establishes this. It seems to me probable that the fixation point varies more widely than this, but there is nothing to indicate that it wanders perceptibly above or below the line.

The return sweep, when a line was finished, was usually without interruption, although about once in six lines a halt would be made near the end of the movement, apparently for the eye to get its bearings in the new line. These halts in the return movement are more numerous in reading long lines. The eye is apparently guided in making the return by the consciousness

of the next line's beginning, seen dimly at the left as it starts. Such guidance would, of course, be less accurate as the line is longer, and this may necessitate both the haltings and the distraction that we notice introspectively when we lose the line.

The forward movements of the eye in reading were found to occupy a relatively constant line, somewhat irrespective of their extent. In one reading the movements of the eye varied in extent as from four to twenty-six, while the times for these movements ranged from four to seven. Excluding three exceptionally short movements, the others in this same reading ranged in extent from seven and a half to twenty-six, while their times ranged from only seven to six.

The spark record indicated that the absolute time required for each movement forward varied usually between .04 second and less than .048 second. The return movements usually required a little longer, usually from .051 to .058 second. Later experiments indicate that the times are actually considerably shorter than this.

In all the experiments whose results are given above the readers read at their usual rate, silently, and for the thought. In another series of tests they were asked to read as fast as possible. This decreased the number of pauses per line and also the duration of the pauses. The extent of each eye movement was correspondingly increased. The speed of the movement was not increased in the least, and there was nothing in any of the experiments to indicate that the rate of movement is subject to direct voluntary control. Fast readers thus seem to perform less eye work, their movements are less fatiguing in so far as large-angled movements may be easier than small ones, and they take less time for visual perception of the printed matter.

H. V. W.

REFRACTION AND ACCOMMODATION.

Contribution to the Knowledge of Hypermetropia. – Broekema, J. C. (*Doctorate Thesis*) after a historical review states, that hypermetropia is a disease, has a clinical picture of which not always all the symptoms have to be presented. For most people the optical definition suffices. But it is not only an optical symptom, an error of the focussing of the eye as a physical instrument. The symptoms are:

Diminished visual-acuity, even after correction of the refraction-anomaly (refraction-amblyopia); in a higher degree diminished visual-acuity of one of the eyes (monocular amblyopia of hypermetropes); difference of refraction of both eyes (anisometropia); convergent strabismus.

Br. used the patients of the Amsterdam University dispensary with hypermetropia, under 35 years old, who came without complications, except emmetropia or astigmatism of one eye. 30426 visited the dispensary during 1898-1904 with 2350 hypermetropic eyes. The number of eyes with hyp. of 2 D. surpasses in number those with hyp. of 1 D. Higher degrees are not very frequent, so that cases above 8 D. are rare. The refraction anomaly of 1 D. remains subconscious with this class of patients. The difference in number of 1 and 2 D. would be still larger, if not a large number of cases with 1 D. was discovered on examination for civil service. The eyes with 1 and 2 D. together from 55.4 per cent. of the entire number; from 3 to 6 D. the number gradually decreases to diminish then much stronger.

The visual acuity after correction of the manifest refraction is diminished with hypermetropes of higher degree (refraction-amblyopia). When both eyes are hypermetropic usually one eye has a vision less than corresponds with the degree of hypermetropia. Br. found that with an increase of the refraction anomaly the vision has more chance to become less; that the normal vision predominates up to a hypermetropia of 6 D.; that with a hypermetropia of more than 6 D. the most frequent vision is 1/2· 1734 are isometropic eyes and 724 anisometropic, which include 87 emmetropic eyes, which are counted because the second eye is hypermetropic. Of 100 hypermetropes 30 per cent. are anisometropic, 70 per cent. have the same refraction. The lower degrees of hyp. are mostly insometropic, the higher ones anisometropic, but the difference is not very pronounced. The number of 2 D. predominates also under the anisometropic eyes; the degrees of 3 to 6 D. are nearly equally frequent; a hyp. of more than 8 D. is the exception. The curve representing the visual acuity decreases gradually from Vision 1 to 3/4 with hyp. 1 to 6 D. Vision 1 predominates also with hyp. 5 and 6 D., but is less frequent with the increase of dioptres. Vision 1/2 is here as frequent as

with hyp. of 3 and 4 D. The number with vision 1.3, 1.4 and 1.6 is such, that it cannot be neglected; 192 of the 867 persons with equal degree of hyp. in both eyes had an unequal vision (= 22 per cent.); also here the refraction hyp. 2 D. prevails. The per centage is as follows: With hyp. 1 and 2 D. 6.1 per cent.; with hyp. 3 and 4 D. 19 per cent.; with hyp. 5 and 6 D. 27 per cent., and with 7, 8 and 9 D. 21 per cent. of all cases with isometropia show unequal visual acuity. The number of cases of hyp. above 7 D. is too small for deductions; except these we see a pretty regular increase with the increase of the hyp. until 6 D.; the change for unequal vision with isometropia is larger, the larger the refraction anomaly is. Under the 867 isometropic hypermetropic persons 108 (12.5 per cent.) have an important difference of vision of both eyes, 48 (7 per cent) of these squint.

The visual acuity of the best hypermetropic eyes with anisometropia depends on the degree of the refraction and is independent of the fact, that such an eye is combined with a less-valued.

If anisometropia is combined with strabismus in hypermetropia, then the visual acuity becomes less as in the cases, where strabismus is absent. This influence is felt especially with the higher degrees. Strabismus is found more in the higher, less in the lower degrees of anisometropia; in the highest degrees it is again less seen.

Under 30426 patients during 7 years 6 persons with hyp. 9 D.; 7 with hyp. 10 D.; 2 with hyp. 11 D. and 2 with 16 D. were found. In two cases the condition was familiar, in one case with two sisters, in another with 3 brothers.

A case of carcinomatous metastasis was observed, where the refraction originally myopic astigmatic became hypermetropic, through shortening of the optic axis. This seems to happen oftener with metastatic carcinoma probably because it develops with preference at the posterior pole. A 14-year-old girl was seen with a curvature-hypermetropia through aplantatio corneae in both eyes. According to the mother she had never suffered with her eyes, but in both eyes maculae corneae as a central disc with some peripheral opacity is found. The curvature of the cornea is in the right eye 31 D. hor., 28 D. vert. In the left eye 30 D. 70° nas., 25 D. 20° temp. (12 D. is

normal). Refraction of the right and left eye separately hyp. 3 D., binocular hyp. 6 D., vision after correction in each eye 1/4.

Another case of aplantatio corneae (the corneae curvature was 9 mm. = 37.5 D., vision after correction with hyp. 7 D.; 1/4 macula corneae; while the other eye was emmetropic and had a corneal curvature of 7.5 mm. = 44.75 D.; vision 1) was seen in a 13-year-old girl.

Strabismus with hyp. was found 163 times; 4 cases were divergent strab. Of these 4 one was insometropic, in this and another case the vision of both eyes was much less than normal.

Of the 159 convergent strabismus cases 98 are isometropic (11 per cent.) and 61 anisometropic (16.5 per cent. of the anisometropes). It is found most frequently with hyp. 2 D., decreases gradually until 7 D. to appear only sporadically after this. Vision 1 is very frequent with squinting anisometropic eyes, vision below 1/2 does not happen. The best squinting anisometropic eyes have usually vision 1, although cases of 1/3 and 1/4 are found, but these sporadically; the weak eyes here show two tops: one where the vision has still some value (V. = 1/3) and one with vision = 1/10 (eyes with diminished value). In 121 cases, 54 the right eye was the worst, and 67 the left. Br. wanted to find if these facts speak for amblyopia exanopsia, but found that the number of cases of uncomplicated amblyopia surpass very much the number combined with strabismus, which speaks against an amblyopia caused by strabismus. A certain number of persons are amblyopic in both eyes with isometropia; these do not show at all strabismus. Anisometropia could cause strabismus, as the strongest hypermetropic eye does not receive sharp images, this lacks the occasion for exercising in the analysis of sharp images. This would account for a large number. Br. had 57 strabotic isometropes, 74 non-strabotic anisometropes and 27 strabotic anisometropes, the monocular amblyopia of which could easily be explained by anopsia. But 78 non-strabotic isometropic eyes are found at the same time, which can not be explained in this manner. The weak eye of isometropics without strabismus receives good images at the right place; why should it not be exercised? These facts lead to the conclusion of a congenital amblyopia. The only opposition is found in the

fact that the weak eyes of the hypermetropes can be ameliorated through exercise. But the well authenticated cases are few. We see that as a rule the weak eye does not become better through exercise, even in the most favorable conditions; Br. found in his statistics 78 such eyes which had remained weak although in the most favorable circumstances. A more complicated explanation must be looked for, which embraces both these groups of contradictory facts. E. E. B.

Headaches Due to Functional and Organic Disturbances of the Eye.—Blum, H. V. (*New Orleans Med. and Surg. Journ.*, May, 1909), believes that inflammations of any part of the eye, or growths in any part, is capable of producing headaches.

Inflammations of the eyelids, styes, and chalazia.

Inflammations of the iris and ciliary body, episclera and sclera, chorioid and retina.

Inflammations of the optic nerves.

Glaucoma.

By far the most important of these organic diseases, because it is more often overlooked, is glaucoma. Glaucoma is a disease almost peculiar to hypermetropes. Myopes rarely have glaucoma. The frequency of this disease in the far-sighted eye is no doubt due to the fact that the eye is a small one. The cornea is small, the chamber is shallow, and the ciliary processes are large. There is a disproportion between the size of the lens and the front part of the eye. (*Abs. Charlotte Med. Journ.*, July, 1909). H. V. W.

RETINA.

Investigation into the Fusion Sensibility in Diseases of the Fundus. Hessberg, Munich (*Graefe's Arch.* LXIX-2, Nov., 1908). H.'s investigations were undertaken because of Braunstein's statement that not only is the method of clinical study of the differences in sensibility of the retina by intermittent light stimulus scientifically founded but by it, it is possible to diagnosticate an eventual disease which could not have been determined by other means. The cases studied represented optic atrophy, retrobulbar neuritis, neuroretinitis, hemorrhagic, retinitis, detached retina, disseminated chorioiditis.

The diminution of the fusion frequency in pathologically altered eyes was always detected although very slight but was in some way proportionate to the pathologic-anatomic changes as would be expressed by such tests as the estimation of the accommodation, the visual acuity and visual fields. Moreover the same degree of diminution was found in slight and high degrees of amblyopia. W. Z.

Recurrent Hemorrhages in the Retina and Vitreous Followed by Retinitis Proliferans in Both Eyes in a Young Man with Surgical Tuberculosis.—Kipp, C. J., Newark, N. J. (*Arch Ophthal.*, July, 1909, XXXVIII, 349), describes a case of retinitis proliferans, in both eyes, following recurrent hemorrhages in the retina and vitreous. The patient was twenty-five years of age. At age of six years he had an inflammation of the eye, probably phlyctenular, and a purulent inflammation of the middle ears. At age of seventeen he had tuberculosis of the hip. When eighteen he had paralysis of the external rectus muscle of the right eye. At age of twenty he was injured in left eye by piece of wood, and one year later the vitreous was full of floating opacities. At age of twenty-one he had hemorrhages in retina and vitreous in right eye, and this was followed by retinitis proliferans, which destroyed the sight. In the left eye the hemorrhages were followed by retinitis proliferans and by more attacks of hemorrhage.

The author refers to the possibility of tuberculous disease of the retinal blood vessels, as being a cause of the recurrent hemorrhages.

The article is illustrated. W. R. M.

Concerning a Form of Retinal Disease with Extensive Exudation; Being a Clinical Contribution, with the Report of Two Cases.—De Schweinitz, G. E., Philadelphia (*Arch. Ophthal.*, Sept., 1909, XXXVIII, 463), describes two cases in which the fundus lesion was characterized by an extensive mass of exudation, and believes that they correspond to a group of cases recently described by Coates (*Royal London Ophthalmic Hospital Reports*, XVII, part 3, 1908).

In case 1, ophthalmoscopic examination showed a punctate hyalitis, retinal veins distended and tortuous, and beneath the retinal vessels, and crossing the eyeground in a vertical direc-

tion, there was a broad area of greenish-white exudation, somewhat knobbed in appearance, over which were scattered glistening masses, probably cholesterin. There were small areas of pigment along the margin of the mass of exudation. The elevation of the exudate was from 2 to 6 D. The etiology was unknown. The onset of the fundus lesion was not definitely known, but the history indicated a duration of about one year. Treatment gave no results.

In case 2, ophthalmoscopic examination showed, in the right eye, punctate and weblike opacities, and a large area of white exudation which had an elevation of 4 D. and which was mostly beneath the retinal vessels. Edges of the disk were cloudy and veins congested.

At a later examination the mass of exudation had assumed a knobbed appearance and was elevated as much as 6 D. and showed a brownish-yellow color in parts. Veins were dilated and arteries sclerotic. Etiology unknown.

In case 2, the eyes had been subject to expert ophthalmoscopic examination at intervals for one year prior to the appearance of the eye lesion, and the onset of the fundus changes first appeared in the form of retinitis with obliteration of the optic nerve edges and two small hemorrhages down and out from the nerve-head.

The article is illustrated. W. R. M.

On Berlin's Opacity with Preservation of Normal Vision.—Rosenhauch, E. (*From the Eye Clinic of Prof. B. Wicherkiewicz in the University of Krakau. Archiv. für Augenheilkunde,* LXIV, 3, 1909, p. 289). The left eye of a boy aged 11, was struck by a stone, which caused a wound below the temporal orbital margin, hyperemia of conjunctiva with a few small ecchymoses. The pupil was of normal size and reacted normally. Ophthalmoscopically there was a triangular shaped milky opacity on the temporal side of the disc, a similar opacity at the macula lutea and a dark spot at the fovea. V. was normal, no scotomas, and the opacities disappeared in a few days. R. assumes in such a case extra- and intraretinal exudations. Although they generally end with complete recovery and disappearance of the ophthalmoscopic changes, R. thinks that these may be so slight, that they can be detected only microscopically. C. Z.

SINUSES, NOSE AND EAR.

Affection of the Optic Nerve in Diseases of the Posterior Sinuses of the Nose. Van der Hoeve, J., Utrecht (*Archiv für Augenheilkunde,* LXIV, I, 1909, p. 18). A man, aged 24, noticed that the vision of his left eye commenced to fail. At the examination V. was 3/60 with excentric fixation. Retrobulbar neuritis was diagnosed, and the patient was treated for 6 weeks without result. He then consulted Prof. Snellen, who suspected a nasal affection and referred the case to Dr. Onix for operation. At the hospital, van der Hoeve found the following condition: both discs showed a partial temporal atrophy, the region between disc and macula also presented atrophic changes, the veins were thicker and darker than normally, and in the left retina were a few hemorrhages above the disc. The visual field of the left eye was contracted for red, presented a central scotoma for all colors including the blind spot. The blind spot of the right eye was greater for colors than for white. The patient did not complain of his nose, but the left middle turbinated body was swollen.

Opening of the left ethmoidal and sphenoidal sinus and removal of the edematous infiltrated mucous membrane had no influence on the condition of the eyes. As the scotoma of the right eye grew larger and V. decreased to 1/6, with slight nyctalopia, the right sphenoidal sinus, which was very large, was opened. The mucous membrane was infiltrated but no pus was found. The next day the scotomas were smaller and V. gradually rose to 1/3. The improvement was permanent in the left eye, but the condition of the right after a few weeks was again impaired.

There was an inflammation of the axial fascicle of the optic nerve from affection of the posterior nasal sinus, which had become atrophic, when the patient came for treatment. As the operation of the left sinus had no effect and the condition improved after opening of the right sphenoidal sinus, the author surmises, that, in concordance with the investigations of Onodi, the right, not the left, accessory sinuses were in close relation to both optic nerves. Probably the right, as well as the left, optic canal passed through the right sphenoidal or ethmoidal sinus.

The author lays great stress on the enlargement of the blind spot for colors as the first symptom found and advocates careful examination of the blind spot, as it is very important to diagnose the disease before the appearance of a central scotoma, which frequently is due to an irreparable functional disturbance. H. found this symptom in 2 other cases which are briefly reported. In one, a case of ethmoiditis posterior, it was the only symptom of the affection of the optic nerve which was completely cured by treatment of the nose. C. Z.

Neuritis Nervi Optici of Nasal Origin.—Paunz (*Wiener Medizinische Wochenschrift,* May 15, 1909).

Acute or chronic neuritis of the optic nerve can be brought about by an inflammation of the posterior accessory sinuses of the nose, even when no orbital phlegmon exists.

Both optic nerves may become affected although the infection in the nose be only unilateral.

The power of vision diminishes in very acute cases very rapidly, and this is followed by total blindness in a few days. In all cases there was color scotoma.

Ophthalmoscopically, one could find papillitis, venous hyperaemia, temporal paleness; and sometimes no visible change could be observed.

The more acute the case, the more gratifying will be the result of operative interference in the nose. J. G.

SYMPATHETIC OPHTHALMITIS.

Concerning Sympathetic Ophthalmia.—Fuchs, Vienna (*Graefe's Arch.,* May, 1909), reports a group of cases bearing on the pathology of this affection. In the first case the points of interest were: 1. The outbreak of an attack of s. o. where the exciting eye had remained entirely free from irritation 29 years. 2. The fresh exciting infiltration of the chorioid. This could easily be distinguished from the products of the original inflammation resulting from the perforation of a corneal ulcer. 3. The type of sympathetic inflammation. In the beginning the iris was not affected. The precipitate came from the ciliary body, the cells passing from the angle of the anterior chamber into the aqueous. The vitreous

opacities also came from the ciliary body. The choroid next the ciliary body was affected, the yellow foci in the choroid being an expression of small foci of inflammation. Here the choroid is so thickly infiltrated with leucocytes that the vessels are entirely covered. Such foci must appear yellow, especially if the overlying pigment epithelium is unchanged. The retina being normal cannot hide the foci.

Two cases are reported in which s. o. developed in the absence of plastic inflammation in the injured eye. The author states that he would not report these cases, as they are of such frequent occurrence, except to emphasize that plastic inflammations of endophthalmitis do not belong to the class of exciting inflammations. When it occurs in a high grade type it is calculated to intercept exciting inflammation.

A case is added to those reported in the author's first contribution on this subject in which s. o. developed in the absence of plastic inflammation, in which an anatomic examination was made. The exciting inflammation was found to be so slight that it was surprising that a sympathetic inflammation could result; while the latter was so severe that the anatomical changes in this eye might well be more marked than in the exciting eye. The points of interest were, 1. The outbreak of the s. o. after enucleation; 2. The slight grade of the endophthalmitis; 3. The still milder grade of the exciting infiltration with a quite severe s. o.

An exhaustive report of a case of "exciting inflammation without s. o." is given. These are the cases in which F. believes the term may be rightly used as representing a stage coming under microscopic examination before the s. o. has developed in the other eye. The points of interest are:

In contrast with the former there was severe endophthalmitis and severe exciting inflammation but no s. o.

The last case is one in which Fuchs thinks there was the beginning stage of exciting inflammation. His belief for this rested on the following facts: The retinal inflammation was greatest in the inner layers and quite insignificant in the outer. In many places none at all. There was no relation as to locality between the chorioidal and retinal areas of inflammation. The first is diffuse, the latter is focal. The exudate in the outer layers of the retina is in part polynuclear leuco-

cytes; in the choroid entirely lymphocytes. These were found not in the capillary layer, where in severe enophthalmitis the pus collects under the vitreous layer of the choroid but on the contrary more in the outer layers of the choroid.

W. Z.

A Case of Cured Sympathetic Amblyopia. Fejer, Julius. Budapest (*Central für prakt. Augenheilkunde*, August, 1909, p. 237). The right eye of a woman, aged 28, became blind, at the age of 1½ years, from smallpox, as she stated, although she had no scars in the face. On May 10, 1909, she came to F., on account of inflammation and pain in the right eye, for the last 2 weeks, headache and rapidly failing sight of left eye. The right eye was shrunken and stone hard, chemotic and very painful to the touch. The left eye was without irritation, conjunctiva, cornea, media, fundus were perfectly normal, V. 1/lxx, V. F. very much contracted. On May 12, the right eye was enucleated, in local cocain anesthesia by retrobulbar injections. At the change of dressing the next day, the patient could see much better, and, on May 17, V. had risen to 7/v, V. F. and accommodation were normal.

The sclera of the enucleated eyeball was thickened, the shrunken lens and ciliary body surrounded by a shell of bone and the intraocular tunics totally degenerated. The intense shrinkage and ossification around the ciliary body may have been the cause of the sympathetic irritation, *i. e.*, of the amblyopia, as some authors described the formation of bone as the cause of sympathetic inflammation.

Such cases demonstrate the probability of the ciliary theory and prove, that the irritation travels by reflex through the ciliary nerves from one eye to the other, because no objective changes are found in the sympathetically affected eye and the functional disturbance disappears immediately after enucleation with restoration of normal vision. C. Z.

The Treatment of Sympathetic Ophthalmia with Sodium Salicylate. Widmark (*Weiner Medizinische Wochenschrift*, May 15, 1909).

Out of 12 cases of sympathetic ophthalmia 8 were treated

with sodium salicylate 4 to 9 gms. per diem with excellent results. In 9 cases the injured eye was removed. J. G.

TOXICOLOGY.

On Atoxyl Poisoning, with Especial Reference to the Visual Organ.—Igersheimer, J. (*From the eyeclinic of Prof. Th. Leber in the University of Heidelberg. Deutsche Medizinische Wochenschrift,* 1909, No. 26, p. 1142). The so far known 46 cases of atoxyl amaurosis show, with the exception of 2 of Fehr, a great resemblance: A few weeks after the commencement of the atoxyl cure the patient complains of flickering, which may be preceded by general symptoms: weakness, vomiting, nervous symptoms and disturbances of hearing. V. commences to fail, although the ophthalmoscopic condition may be normal. A contraction of the visual field, however, is never missing, especially at the nasal side. The visual disturbances grow progressively, and simple atrophy, with sharp borders of the disc and thin arteries, develops. The prognosis of this, always bilateral disease, is absolutely bad. It ends in complete blindness, even if at the beginning of the intoxication phenomena, the remedy has been discontinued. Treatment is perfectly powerless.

I. studied the pathogenesis of this peculiar intoxication amblyopia experimentally in dogs, cats, rats and rabbits. As a preliminary test he injected atoxyl locally into the eye. While injections into the anterior chamber remained negative, those into the vitreous and under the conjunctiva proved degeneration of the ganglion cells of the retina, and the optic nerve, and iridoplegia. After subcutaneous injections in dogs and cats more or less intense degeneration of the ganglion cells and the inner granules of the retina, with Marchi-degeneration of the optic nerve, resulted. The exterior layers of the retina, the other tunics, vessels and supporting tissue were intact.

While dogs showed no general nervous symptoms, cats invariably developed severe ataxia, followed by spasms and spastic pareses shortly before death. In some animals maximal mydriasis alternated with maximal miosis.

That the retina may be primarily affected by the poison was demonstrated in the rat, in which after subcutaneous in-

jection an isolated destruction of the neuroepithelium was ascertained.

The pathogenesis of the poisoning by atoxyl may thus be summarized: The poison attacks one, or simultaneously several, places of the nervous visual apparatus, destroys the nervous tissue without reactive processes, resulting in simple degenerative atrophy of the optic nerve.

In the dog there were always intense hemorrhages in the kidneys between cortex and medullary substance, due to primary disturbances of circulation and secondary destruction of the urinary canaliculi. In the cat, after longer use of atoxyl, catarrh of the mucous membranes, conjunctivitis and alopecia, etc., were observed.

These facts show, that the atoxyl intoxication is composed of 2 kinds of actions: 1. specific effects of atoxyl and 2. general symptoms due to arsenic. The affection of the eyes is mainly due to the atoxyl itself, eventually to a closely related product of reduction, not to anorganic arsenic. C. Z.

TRACHOMA.

Trachoma Bodies in the Deeper Conjunctival Tissue. —Radziejwski, Berlin (*Wochensch. f. Therap. u. Hyg. d. Aug.*, August 19, 1909). These investigations were made under Leber's control. Deeply excised portions of various trachomatous conjunctivae were hardened and imbedded in paraffin and allowed to remain one week. Only sections at least 4 m. thick gave useful results. With Giemsa's stain they did not show characteristic developmental stages relative to the nucleus and envelope, but with G.'s stain and a modification of Heidenheim's method the trachoma bodies were demonstrable in the deeper tissue sections. W. Z.

New Experiences with the Treatment of Trachoma by Excision. Blumenthal, L., Riga (*Beiträge zur Augenheilkunde*, Heft 73, p. 35), maintains that after the innumerable kinds of medicamentous treatment and the application of radium have entirely failed the surgical interference remains, as before, the only reliable means of combating trachoma. Among these excision is the most effectual. B. feels justified to this assertion from his observation of more than 4000 cases operated upon within the last 15 years.

He discusses the following questions: 1. Is the primary result always favorable? 2. Is the favorable result permanent? 3. Is the operation harmful in some cases?

The first question is answered in the affirmative. But the excision must be performed in a stage of the disease in which there is something left for excision. This stage is almost unlimited. B. operated on a large number of cases in which the affection had existed from 20 to 40 years in individuals who had been subjected to all possible treatments and had become miserable and unable to work, and by excision obtained almost normal conditions of conjunctiva and cornea. In opposition to Heissrath and Kuhnt, B. lays especcial stress on the excision of all diseased tissue of the lower lid.

The permanent result depends on the primary care, and the careful after treatment after the operation.

As to the 3d question, there is one, fortunately rare, danger, viz.: the development of ptosis. B. saw this only in 1 per cent. of his cases. To avoid ptosis the following points are mentioned: Avoidance of narcosis. In recent cases not too large pieces must be excised, especially not at the external and least at the inner angle. The incision must not extend too far into the ocular conjunctiva, as then Müller's muscle is apt to be injured. Pre-existing ptosis may be aggravated by the operation. In deep-seated or flat eyes (high hypermetropia) ptosis may result, also in short lids and blepharophimosis, in which a preliminary canthoplasty is recommended. Very exuberant granulations predispose to postoperative ptosis, which cannot be avoided. The mere possibility of postoperative ptosis is no sufficient reason to discard the excision, since without operation in most cases ptosis of much higher degree ensues. The ptosis can be remedied by operations, of which Pagenstecher's thread operation deserves preference. B. contradicts the assertion that xerosis may be a consequence of excision and contends that an excision *lege artis* and careful after treatment prevent the development of xerosis.

C. Z.

To the Discovery of the Trachoma Corpuscles. — Greeff, R., Berlin (*Klin. Monatl. für Augenheilkunde*, XLVII, II, Juli, 1909, p. 84), once more sets forth in detail his discovery of the trachoma corpuscles with reference to

the priority claimed by Halberstoedter and von Prowazek. His purpose is to show that he never intended to belittle their merits by claiming the discovery exclusively for himself, but that he is entitled to emphasize the originality of his investigations and that of his collaborators. G. is engaged as heretofore to develop by further researches the discovery which is still in its initial stages. C. Z.

The. Etiology. of Trachoma. L. Halbustaedter, S. Prowazek (*Weiner Klinische Rundschau,* July 4, 1909).

The presence of trachoma corpuscles, which are the cause of trachoma was corroborated by Frosch, Leber and others. There is only one corroborative factor missing, and this is, the possibility of infection with a pure culture of these corpuscles. J. G.

TUMORS.

Voluminous Sarcoma of the Bulbo-Palperbal Conjunctiva. Roy, J. N., M. D. (*The Ophthalmoscope.* April, 1909). The case is one of an unusually large sarcoma in a child six years old, occurring in the right eye. The tumor showed itself a month previous to his appearance in the hospital and was marked by ptosis. Family and personal history was negative, otherwise than the presence of adenoids. The size of tumor was such that it entirely obscured the right eye and lay against cheek, being attached to the cul-de-sac by a small pedicle. It was granular in appearance, bled easily to the touch, and was of an angry red color. Very much distended and accompanied by a sero-purulent discharge from the eye. The tumor measured 2 x 5 x 7 cm. Ocular tension was not increased and no exophthalmus. Vision was as good as in the left eye. There was a slight hypertrophy of the cervical and pre-auricular glands.

Pathological examination of a small piece of the neoplasm confirmed the clinical diagnosis.

The operative procedure consisted of complete exenteration of the orbit. All doubtful tissue was removed from the eyelids and the wound carefully cleansed.

Post-operative treatment consisted of daily washing with hydrogen peroxide. At the end of a month the patient was considered nearly cured.

Scarlatina and varicella then developed. On March 13th nephritis came on, followed by endo-carditis, and on March 20, general oedema appeared. The orbit was then treated for the granulation tissue which had taken place in the meantime, and at the end of a month the wound in the orbit was entirely healed.

The upper lid being retracted, left the lids slightly open and caused a disagreeable appearance which exposed the patient to infection from the outside. A median tarsorraphy was performed on June 4th.

At the time of report of this case, 14 months from the date of operation, recurrence had not taken place.

A. M. MacW.

Contribution to Our Knowledge of Iris Tumors. Franke, Hamburg (*Graefe's Arch.*, LXXH, II, April, 1909). The patient, a woman of 50 years, had accidentally noticed the growth two weeks previously. The tumor filled the angle of the anterior chamber and reached almost to the pupillary margin. Its surface was smooth and avascular. The pupillary border of the iris was attached to the capsule of the lens. The eye was free from injection, T. N. and V. = 1/3. After 4 weeks of ineffectual treatment enucleation was advised and on its rejection iridectomy was performed., After 2½ years there has been no recurrence.

Microscopically there are various sized polygonal cells of an epithelial character with vesicular nuclei with beautifully developed granule bodies and chromatin net. The cells lie close to one another without intercellular substance. Only in the peripheral parts of the growth are the intercellular lymph spaces distended, giving the appearance of a covering epithelium rich in fluids. The cell protoplasm was here also rich in fluids giving in many places a honeycombed appearance to the new formation. The protoplasm was here in parts so liquified that only the spongioplasm is retained, in other places there are cells with a small amount of protoplasm in the midst of large spaces. There is a quite richly developed vascular net with which the described cells are in intimate association as though genetically connected with the vessel walls and having their origin from the perithelium. The isolated mitosen found in the perithelium also indicates this. Scattered throughout

the growth are branching pigmented cells and free pigment. Together with the above are tumor giant cells and voluminous tumor cells. Of true iris tissue there is but little present. A small sector is demarked by pigment which might be mistaken for the remains of original pigment from pigment cell development in the surrounding scantly pigmented area. In this sector there is rich vascularity and pigment growth is going on about the vessels. The walls show slight hyalin thickening. Throughout the tumor, in isolated vessels, there is heaping of round cells of lymphoid character.

A remarkable peculiarity of the growth is the central cavity which taken with the fluidity of the protoplasm may be looked upon as a cystic softening similar to that observed in tumors of the external skin. There is a mucoid softening of the connective tissue parts surrounding the tumor as the result of congestive oedema.

The author says that clinical experience demonstrates that the pure forms of peritheliomata are on the whole benign growths as shown by p. of the parotid of the dura mater and of the sheath of the opticus. And it is likely that tumors of this type in the iris may run a benign course. Because of this the author considers it important to separate pathologico-anatomically the different tumor types rather than to group them under one head. He considers the question of iridectomy versus enucleation still an open one. W. Z.

Congenital Fibroma of the Cornea—Report of a Case. —Mann. W. A., Chicago (*Jour. Ophthal. and Oto-Laryng.*, June, 1909, iii, 219), reports a case of congenital tumor, arising from the corneal tissue, present in a patient aged 19 years. Removal of the growth and microscopical examination showed it to be a fibroma. W. R. M.

A Case of Sarcoma of the Chorioid in Early Childhood.—Jess, Goettingen (*Graefe's Arch.*, LXIX-H. 2, Nov., 1908). The tumor was found in a child 3½ years of age. The eye had been sightless and the seat of a complicate cataract for more than a year. The diagnosis had been tuberculosis of the iris, but as at the enucleation the nerve had the appearance of a gliomatous infiltrate an exenteration of the orbit was performed. The child died one month later. There had been

no local return. Microscopic examination showed a melanosarcoma of the chorioid. The author thinks that the course of the case rather combats Fuch's view that inflammatory phenomena belong to the second stage of sarcoma and agrees with that of Kerschbaum that degeneration from a tumor mass may take place at any stage and consequently the reactive inflammation resulting therefrom belongs to no particular period.

W. Z.

Metastatic Carcinoma of the Orbit, with the Report of a Case.—Shumway, E. A., Philadelphia (*Arch. Ophthal.*, September, 1909, XXXVIII, 484), reports a case of metastatic carcinoma of the orbit, and calls attention to the fact that only four cases are on record of involvement of the orbital tissues and ocular muscles by carcinoma, as a result of metastosis from distant organs, without involvement of the eyeball.

The author reviews the four published cases, and gives the clinical history, autopsy report, and microscopic findings in his own case.

There was no involvement of the chorioid, and the author adds: "We are justified in placing it among the very rare cases in which the metastatic elements enter the branches of the ophthalmic artery which supply the muscles or orbital tissue, instead of passing into the more numerous ciliary arteries, under which circumstances we have the production of the much more common condition, metastatic carcinoma of the chorioid."

The author also adds that in every case of isolated paralysis of an ocular muscle in an adult, the patient should be examined for carcinoma.

W. R. M.

A Case of Cyst in the Anterior Chamber.—Hirschberg, J., and Ginsberg, S., Berlin (*Centralbl. für prakt. Augenheilkunde*, August, 1909, p. 255). The right eye of a laborer, aged 27, was injured by a piece of metal. Its presence in the eye was shown by Roentgen rays but it was not extracted. Five months later he came to H. with V = 1/xxxv, visual field contracted towards the nose, up to 40°. There was a large scar at the nasal sclerocorneal junction, the pupil, drawn to the nasal side, responded to light. A transparent cyst, 6 mm. wide, filled the nasal portion of the anterior chamber. Slight opacity of lens, floating opacities of vitreous, in-

wards and downward a bluish stable opacity. Sideroscopy was negative.

After 2 months the patient returned with the statement, that a month ago the cyst had been punctured, but not emptied. It now was enlarged and filled the nasal third to the posterior surface of the cornea and beyond the pupillary margin. Its anterior wall was transparent, its posterior wall yellowish and opaque. V. fingers at 60 cm., visual field contracted. The Roentgen skiagraph showed a long foreign body in the interior, As there were no distressing symptoms, the patient was dismissed.

About 4 months later he returned with excruciating pain in the eye, which was very much irritated. The anterior chamber was abolished and the cyst completely collapsed. The next day enucleation was performed, and the eye placed in 75 per cent. alcohol and examined by Dr. S. Ginsberg, whose detailed anatomical report is given. The pathogenesis of the cyst was as usually accepted, it developed from the anterior surface of the iris. C. Z.

VITREOUS.

Synchysis Scintillans.—Sommer, Zittau (*Wochensch. f. Therap. u. Hyg. d. Aug.*, July 15, 1909), states that in the case seen by him the opacities in the vitreous have had a glistening silvery appearance and not golden as described by most authors (Ib., Aug. 12,, 1909) Wiegemann, Hildesheim has seen both golden and silvery showers and believes that the chemical composition as well as the illumination is a factor in producing these variations. With an oil light they are of a reddish-yellow, and by electric and gas light, of a whitish appearance; Oppenheimer, Berlin (Ib. Aug. 19, 1909), says that he has seen about 6 cases in ten years' practice and only once had the crystals a golden appearance. All were observed under an argand light. W. Z.

VISION AND COLOR VISION.

On Pathologic Color Sensations Following of Surgical Diseases.—Hilbert, R., Sensburg (*Klin. Monat. für Augenheilkunde* XLVII, II, Sept., 1909, p. 290), collected

27 cases of color vision after injuries of various parts of the body, viz.: erythropsia 6, xanthopsia 10, kyanopsia 5, chlosopsia 4, and ianthinopsia 2. Either the whole visual field appeared in the color, and this was more frequent, or colored spots were seen in irregular arrangement, either occupying a constant position in the visual field or movable. The predominance of the warm colors red and yellow over the cold colors of the spectrum corresponds with the fact that red and yellow leave a more intense impression on the sensorium than green and blue, are first recognized by children and play a chief part in the ornaments of non-civilized peoples. C. Z.

Research in Color Vision.—Wadsworth (*Weiner Medizinische Wochenschrift,* Aug. 28, 1909).

Colors have considerable effect upon the nervous system of man and animals; they can produce irritation of a sexual nature, fright, sorrow or rage; they can also produce a soothing and pleasing effect. Different individuals are differently affected by various colors. Yellow has the strongest effect on men, then follows blue, red and lastly green. Indifference to color is often found in people who indulge in sexual excesses.

We do not possess very much knowledge of violet blindness; this affection is found only in diseases of the retina, ablatio retinae, albuminuria, pigmentosa and glaucoma.

The patient complains of a diminution of vision, and of seeing blue, violet or green spot; the spectrum is shortened on the blue side; yellow and blue appear colorless, and violet is considered green.

The author believes the cause of violet blindness to be due to an exudative process in the retina. J. G.

The Topographic Diagnosis of Hemianopsia.—Behr, Kiel (*Graefe's Arch.* LXX-H. II, April, 1909), examined the cases of hemianopsia seen in *Kgl. Universitäts-Augenklinik zu Kiel* to the number of 20 with especial reference to Wernicke's sign and that of Wilbrand,'s prism refl. conjugate deviation. His conclusions are as follows:

1. The hemianopic papillary inaction is with proper investigation demonstrable in every case of tract-hemianopsia accompanied by large absolute field defects.

2. The absence of reflex eye movements in Wilbrand's prism test is also proof of a tract-hemianopsia.

3. A degeneration of the optic tracts descending from an intracerebral focus leads to a secondary degeneration of the basal tracts through the primary optic centers and with it to a bilateral atrophic papillary pallor only when the hemianopsia is developed in early childhood. The optic atrophy is most pronounced on the same side of the nerve head as the field defect.

4. In these cases the eye with the greatest peripheral field takes over the visual act; the other becomes more and more amblyopic and assumes the position of muscle rest.

5. The remaining visual field contracts to the area surrounding fixation (macular preservation). Failure of this in intracerebral hemianopsia is the exception, and there is great likelihood that in pure tract-hemianopsia this preservation is the rule. Moreover the question as to the place of division of the macular fibres has not been definitely settled.

6. There is a certain fixed relation between the central visual acuity and the preservation of the maculae. Normal vision always indicates preservation while an involvement of them is accompanied by a reduction of from 1/2 to 1/3.

7. A pupillary difference with a difference in the width of the palpebral fissure (the name of the hemianopsia corresponding to the side with the greatest width) renders probable the diagnosis of a lesion of the tract of the opposite side. Further observations are necessary for confirmation.

8. In a relative intracerebral hemianopsia the adaptation on the seeing and on the half which is restricted in its function is equal. The paracentral adaptation in these cases is normal.

9. There is no necessity for the assumption of an isolated color center within the optic perception area. A typical color hemianopsia has no diagnostic localization value. The visual memory area lies in one hemisphere in the occipital or temporal lobe. In the vast majority of cases in literature of disturbance of orientation associated with hemianopsia the lesion with the greatest likelihood has been located in the left hemisphere. It is a center in the narrowest sense of the term.

10. The quality of a visual field defect (expressed through

the smallest observable perimetric object) permits of a fairly accurate conclusion as to the degree of the disturbance of the visual fibres.

12. The nasal retinal half, has a greater pupillomotor excitation than the temporal. The periphery of the retina also has pulliomotor properties.

12. Through a positive result with the prism test of Wildbrand in cerebral hemianopsia proof is afforded of the existence of a subcerebral reflex arc for automatic eye movements.

W. Z.

VISUAL FIELD.

Alteration in the Color Fields in Cases of Brain Tumor.—Bordley, Jas. and Cushing, Harvey, Baltimore (*Arch. Ophthal.*, Sept., 1909, xxxviii, 451), find, from an extensive study of cases, that cases of brain tumor present the same changes in the form and color fields that have been regarded as characteristic of hysteria and believe that almost every patient brought for operation, after the diagnosis of brain tumore has finally come to be read by the ophthalmoscope on his retina, has at one time or another been regarded as hysterical or the subject of some psychoneurosis. The authors have drawn their conclusions from several hundred visual charts taken during the past seven years.

They find no definite relationship between the contraction of the field for form and that for colors. Some of the cases showed a concentric contraction with color reversal—usually regarded as essential signs of hysteria—and these cases showed an early return of the normal relations after the pressure symptoms were relieved by operation.. Another group of cases showed concentric contraction of the form fields together with color reversal, and also peripheral limitations which were relatively greater in the form than in the color fields, and the red was apt to be less affected than the blue.

There were other cases in which there was associated contraction for colors and form, with the exception that the blue was almost invariably much more affected than the red field. The authors found a prominent feature to be not so much the preservation of the red field as the alteration in the blue. In some cases the authors were able to observe the manner of

constriction of the blue field, the contraction apparently being brought about by the formation of peripheral scotoma which gradually became confused.

Their findings seem to show that the changes of most significance, in tumor, are possibly to be looked for in the field for blue and the authors believe this may be of certain differential value, since tabes, multiple sclerosis, etc., show a primary change which is often limited to the red field. Complete achromatopsia occurred in a number of instances. The writers state that the color disturbances do not seem to be dependent upon the presence of neuroretinal oedema, as in four of their cases the color disturbances preceded any appreciable ophthalmoscopic changes, and they regard the early hyperaemia and congestion as a definite stage in the process of choked disk. In six of their tumor cases there was no alteration in the visual field.

Bordley and Cushing have taken their statistics from observations made in fifty-six cases of their series, and the conditions noted were present at the time of the first examination, often before the diagnosis of tumors was certified.

The authors mention the following as striking features: (1) The fact that in many of the charts the fields for form are unchanged, while there is a very definite change in the fields for color. Fifty out of fifty-six cases show color changes; only eighteen show definite form changes.

(2) In four of the cases in which the colors interlaced tumors were found, though there was no choked disk.

(3) In forty-one out of forty-two cases examined subsequent to operation, whether palliative or radical, the color lines become restored to their normal relative position.

W. R. M.

Book Reviews

Dictionary of Ophthalmic Terms, With Supplement.—Magennis, M. D., D. P. H., Edward., Ophth. surgeon to St. Michael's Hospital, Kingstown; Examiner in Ophthalmology to the Apothecaries Hall of Ireland; late Clinical Assistant at the Royal London Ophthalmic Hospital Author of "Eye Symptoms as Aids in Diagnosis," "The Eyesight of Children," etc., Bristol. John Wright & Sons, Ltd. Price, half a crown.

This little work consists of 67 pages, the last twelve of which form a supplement. In this supplement are summed up directions for testing vision, for ordering glasses and a collection of formulae for treating some of the commoner diseases of the eyes. One can scarcely see the reason for the supplement, as it endeavors to put in a small compass points of the greatest importance and ophthalmic science is not one that lends itself to such treatment. Again, the rest of the work is so full and the terms so well explained that any further attraction is only superfluous. Specialists are well up in all the technical terms employed in the study of ophthalmology, but for all that there are many terms, or perhaps more correctly speaking, words derived from the names of individuals that are strangers to many. Its perusal is instructive and interesting, this latter not often found in works of this nature. A. A. Bradburne.

Text-Book of Ophthalmology.—Wright, John W., A. M., M. D., Professor of Ophthalmology in the Starling-Ohio Medical College; Ophthalmologist to the Protestant Hospital, Columbus, Ohio; Member Columbus Academy of Medicine; Member Ohio State Medical Association; Member American Medical Association; Fellow American Academy of Medicine; Member American Academy of Ophthalmology and Oto-Laryngology. Third Edition. 117 Illustrations. P. Blakiston's Son & Co. 1909.

A notable feature of the book is the concise method in which the author deals with each subject. The ground is thoroughly covered without much verbiage. Too many books are published in which the reader, who is generally in a hurry, must cover many pages not relevant to the subject in order to find that for which he is looking. The subjects are concisely dealt with, and not passed over lightly, as one would expect in a book of this size. In the author's method of extraction of cataract in the

capsule, he advocates the use of the finger at the upper edge of the corneal incision, pressure to be made on the lower half of the cornea if necessary. Surely this is not in accordance with modern asepsis and unless one has unusually small fingers, this procedure cannot be as satisfactory as small instruments would be to those who have large fingers. He advocated the extraction of cataract in its capsule as early as 1896 in his first edition.

Throughout the book the subjects are presented in a clear, clean-cut manner. This book is well worthy of attention to those engaged in ophthalmic practice and should find a place in every progressive man's library. A. M. MacWhinnie.

Minor Ophthalmic and Aural Technique.—Murray, Alfred Nicholas, M. D., Assistant in the Department of Otology and Laryngology, Rush Medical College. Formerly Clinical Assistant in Ophthalmology, Rush Medical College. One time Voluntary Assistant in the Universitaets Augenklinik, Breslau. Member of the American Medical Association. Mitglied der Ophthalmologischen Gesellschaft, Heidelberg, etc.

As the book is intended for minor ophthalmic and aural procedures, the details with which many of these are brought are worthy of mention and will find a useful place, principally among nurses and those who are at the very beginning of ophthalmic and aural instruction. The one notable feature about the various chapters in the book is the minutae with which the various details of the minor procedures are given. These minor details which may seem unessential to some readers are the points which are of the greatest assistance to those who are beginning the study of ophthalmology. It is rare that in a book so small we find so many of the smaller details that are accurately given.

While dark glasses are very useful for dispensing with excessive amount of rays, they have not proven so useful in our practice as those of the amber type.

It does seem to the reviewer that using the finger to evert the upper lid makes the procedure a little bit harder and more difficult than if a small blunt instrument were used, which probably would allow you to do it the first time without a failure.

The book is profusely illustrated by many cuts, giving illustrations of instruments that are used, but it is to be regretted that in many instances no credit is given to the originator.

The conservatism of the author is shown by the fact that he

limits himself to three to five milliamperes of the galvanic current, while from 15 to 20 are used, the results accruing not possible with a smaller amount of current.

Mastoid and cataract operations should probably be classed as major operations, and probably could with better propriety not have been mentioned in the book, inasmuch as they are decidedly major operations.

There is at the present time a hook made especially for the removal of artificial eyes by the numerous prothesis makers. This hook can be sterilized by boiling, is usually made of aluminum, and will remove the eye somewhat quicker than the finger probably will.

The reviewer believes that the electric masseur is to be preferred to that of the hand massage by means of the Siegel speculum. It is almost impossible to regulate with any degree of accuracy that of hand as compared with that of the electric masseur.

In the chapter on "Aids to Hearing" no mention is made of such devices as the acoustaphone and the like, which are used by many deaf persons. A. M. MacWhinnie.

Atlas of External Diseases of the Eye, for Physicians and Students.—Greeff, Dr. Richard, Professor of Ophthalmology in the University of Berlin and Chief of the Royal Ophthalmic Clinic in the Charité Hospital. Only authorized English translation—Shedd, P. W., M. D., New York. With 84 illustrations in color from wax models printed on 54 plates with explanatory text. The illustrations are from models in the pathoplastic institute in Berlin. Art Director, F. Kolbow. New York: Rebman Company, 1123 Broadway. Price, $10.00.

This splendid work by Dr. Richard Greeff, in conjunction with the skill of the sculptor, F. Kolbow, is of great interest to the Ophthalmologist. There are 84 colored figures on 54 plates. The plates were obtained by making, after a special method, a mask of the living subject, which was then filled with wax. From the wax models photographic reproduction in four colors was made. These are not schematic representations but the actual cases as they appeared in the University Ophthalmic Clinic of the Berlin Charité Hospital of which Dr. Greeff is the chief. By means of the models, a pictorial plasticity unattainable by the most accomplished draughtsman, is achieved in this work. A condensed history accompanies each figure, explaining the diagnosis and treatment of the diseases. Prac-

tically every external disease of the eye is found in the covers of this book in the most entertaining and instructive manner.

The reviewer cannot recommend this volume too highly to the medical profession. G. I. Hogue.

Transactions of the Thirty-fifth Congress of the Ophthalmological Society. Heidelberg, 1908.—Edited by A. Wagenmann, Jena. 411 p. p., with 22 plates and 17 figures in the text. Wiesbaden: J. F. Bergmann, 1909. M. 12. $3.00.

The first meeting, on August 5, 1908, was opened by Prof. W. Uhthoff of Breslau as president. Then the following papers were read: *Schirmer, O.,* Strassburg: *To the innervation of the lacrimal gland.* All later publications confirmed Schirmer's assertion, in his essay on the anatomy and physiology of the lacrimal organs in Graefe-Saemisch's handbook, that the fibers of lacrimal secretion enter into the 5th nerve very peripherally, belong the greatest part of their course to the facial nerve, and most likely arise from the nucleus of the glossopharyngeal nerve. From his observations on 3 patients with struma and 3 cases of extirpation of the supreme cervical ganglion he concludes that the lacrimal gland, analogously to the salivary glands, receives secretory fibers from the facial and sympathetic nerves, more from the facial, less from the sympathetic. Excitation of the sympathetic nerve alone does not cause secretion, as little as in the parotid gland, and paralysis of the facial nerve completely abolishes secretion, here as well as there.

von Michel, J., Berlin: *On changes of the eye and its annexes in congenital neurofibroma of the skin of the face:* The coincidence of neurofibromatosis and buphthalmia is not accidental. On account of the varying seat, degree and extent of unilateral neurofibromatosis, buphthalmus may be present or absent. Unilateral buphthalmus may be considered as sole symptom of hemilateral facial hypertrophy, when other signs are lacking. v. M. observed in such a case of unilateral buphthalmus fibroma nodules in the anterior ciliary nerves.

von Hoffman, Jr., M., Baden-Baden: *An interesting case of hereditary glioma retinae:* A woman, aged 30, who had as child of two years, glioma retinae of the right eye and was cured by enucleation, had a child affected with the same disease on

both eyes. The left eye of the child was enucleated and presented microscopically a regular glioma retinae endophytum. The glioma of the right eye, which still has some vision, occupied within 10 months ½ of the contents of the globe. *Fealz*, Düsseldorf: *On the relation of corneal opacities to the acuity of vision*, shows that the curvature of the surface of the opacity and its surroundings is of the greatest importance, because the disturbance of function depends on the refraction at the center of the cornea, not on the diffusion of light.

von Rohr, M., Jena: *The theory of anastigmatic cataract lenses*, describes a new combination of lenses with which he succeeded in correcting the astigmatism of cataract glasses for other than axial directions.

Hertel, E., Jena: corroborates *the practical value of the anastigmatic cataract lenses.*

Levinsohn, G., Berlin: *The essential element in the genesis of myopia*, considers as such gravitation acting on the eyeball produced by stooping of the head. The consequence is, in convergence, a traction on the temporal margin of the optic disc, and pressure of the contents of the orbit, increased by congestion of the blood vessels of the orbital fat, on the posterior pole which causes trophic disturbances. The hygiene of the eye for prevention of myopia, must aim to inhibit stooping of the head.

Zur Nedden, M., Bonn: *Experimental investigations on specific relations between retina and kidneys*, describes the changes in the retina which he obtained by injections of nephrotoxin into the carotid artery of rabbits.

Uhthoff, W., Breslau: *On cataract operations in diabetes*, reports his extractions on 115 cases. Five per cent. of his cataract operations were performed in diabetics. Not one eye was lost. U. avoided any change of diet shortly before operation, and kept the patients in bed not longer than one day as the arrest of muscular activity may predispose to coma. None of the cases were operated on in narcosis, but if this should be necessary, U. would, according to the experience of the surgeons, prefer ether to chloroform. The urine of quite a number of his patients contained aceton, but the course of operation was undisturbed. Although postoperative iritis undoubt-

edly is due to bacterial infection. V. thinks that a specific diabetic origin cannot be entirely excluded.

von Hippel, E., Heidelberg: *Palliative trephining in choked disc,* reports on 221 cases collected from literature: In an early operation the prospects for sight are good, otherwise almost always blindness ensues. A number of cases can be definitely cured, which by a later, or no, operation remain alive, but blind. The duration of life of persons operated on at the early stage is encouraging for the operation. The danger of the operation may be lessened by proper precautions. A large portion of the 221 cases was operated on too late. The proper time for operating is when vision begins to fail, and one must not wait for its destruction. As long as V. and visual field are normal the operation may be delayed, on account of the possibility of spontaneous subsidence of choked disc. The possibility of spontaneous recovery is no argument against the operation, as there is no way of predicting whether a spontaneous recovery with restoration of sight will occur.

Krusius, Marburg: *To the pathology of fusion,* reached from his physiological experiments and clinical observations conclusions very similar to the theory of Claude Worth. He advocates to commence fusion exercises at a very early age, and to remedy any amblyopia as far as feasible. K.'s modification of the amblyoscope is described and illustrated.

Leber, Th., Heidelberg: *On the genesis of detachment of the retina,* found with great constancy, in his anatomical specimens changes which must be ascribed to retraction of new formed cellular-fibrous tissue at the interior surface of the retina and in the vitreous. In some cases it could be proven with certainty, that this tissue, at least partially, originated in the ciliary portion of the retina. A part of it may be of mesodermal origin, especially if later on an abundant vascularization develops in this tissue. If the process may be the consequence of an insidious inflammation of the ciliary portion, it will be readily conceived, that, if it progresses, symptoms or iridocyclitis may develop.

Happe, H., Freiburg i. Br.: *To the non-specific serum therapy of ocular affections,* could not confirm by his experiments the favorable results ascribed to Deutschmann's serum.

Schreiber, L., and *Wengler, F.*, Heidelberg: *On experimen-*

tal changes of the retina, produced in rabbits and dogs hypertony of the eye by obstructing the spaces of Fontana through injections of fine granulated iron, and found a great tolerance of the retina by expansion against gradual increase of tension. If the intraocular pressure was rapidly increased, degeneration of the ganglion cells and nerve fibers of the retina occurred. Marchi treatment showed after 22 days ascending degeneration of the nerve fibers up to the opposite optic tract. Injections of scarlet oil proved positively the formation of mitoses and division of the ganglion cells, which so far had not been observed.

Krauss, W., Marburg: *On orbital plethysmography*, a method to observe and register graphically fluctuations of pressure and volume of the orbit, which also opens a wide therapeutic field.

Bielschowsky, A., Leipzig: *On unusual phenomena in mind-blindness*, reports a case in a man, aged 76, who could see everything but not recognize anything. He perceived only the images situated in the center of the retina, had disturbances of orientation, perspective and the peripheral visual impressions, without noticeable defects of the field of vision, and micropsia.

Vogt, A., Arau: *Cause and nature of erythropsia*, proved that erythropsia is not caused by ultraviolet rays, as supposed by Fuchs, but simply a phase of an after image.

Roemer, Greifswald: *Specific therapy of incipient senile cataract*, reports on his treatment of incipient cataract with lentocalin, a preparation made of fresh lenses of animals. In none of his 165 cases a deterioration was observed, in some quite an improvement.

Wolfrum, Leipzic: *Investigations on the macula lutea of higher mammals*, suggest an augmentation of the cones and rods after birth in the growing eye, especially of the foveal cones, which at birth have a very coarse form.

Stargardt, K., Strassburg: *To the pathology of dark adaptation.* Parinaud attributed the hemeralopia in icterus to solution of the visual purple by cholates circulating in the blood. S. tested this experimentally by producing artificial icterus through ligation of the ductus choledochus, but found no difference between the visual purple of the maximally dark

adapted eyes of icteric from that of normal animals, nor was the formation of visual purple retarded in the icteric animal.

Teich, M., Wein: *Experiments on the behavior of animalic tissue in the vitreous of animals.* Sterile tissues introduced into the vitreous caused serous or sero-purulent inflammation by chemical and mechanical irritations. The reactionary immunization of the introduced tissues occurs through evacuation by phagocytosis, incapsulation, or be means of purulent exudation.

Salzer, München: *Experimental contributions to keratoplasty.* Even in the most favorable case, transplanted cornea does not remain unchanged.

Igersheimer, J., Heidelberg: *Experimental studies on the action of atoxyl on the eye,* obtained degeneration of the ganglion cells of the retina and the optic nerve by direct contact with atoxyl or by its introduction into the blood. In the cat the atoxyl probably attacks primarily the central nervous system and produces from here descending degeneration of the various nerves, or the intoxication of the cells of the brain and spinal cord and of the retina are co-ordinated processes, in concordance with the genesis of the retina.

Wessely, K., Würzburg: *On epithelium experiments on the eye.* Subconjunctival injections of scarlet oil produced proliferations only on 2 places, viz., where the cylindrical epithelium passes into pavement epithelium, near the corneal margin and near the ciliary border of the lid. This peculiar phenomenon strikingly corresponds with our views on the increased disposition of all places of transition of one kind of epithelium into the other malignant growths.

Fleischer, Tübingen: *On cytological investigations of the cerebrospinal fluid in eye patients,* found that the cytological examination of cerebrospinal fluid is useless for the differential diagnosis of leutic eye affections. Serodiagnostics for the differential diagnosis of leutic eye affections are warmly recommended.

Lohmann, W., München: *On the question: Contraction of the pupil due to convergence or accommodation in near work,* assumes a merely synergic internuclear connection between the nucleus of the sphincter and center of accommodation as well as center of convergence.

Polack, A., Paris: *On the diploscope of Rémy*, describes the diploscope which serves for detection of simulation, physiological study of binocular vision and diagnosis and treatment of its disturbances.

Chevallereau, Paris: *On combined transverse keratotomy.* The operation consists in transverse keratotomy with von Graefe's knife and removal of iris and lens, and serves to give a better stump for prothesis.

Adam, Berlin: *A new method of treating blennorrhea of adults*, with bleno-lenicet-ointment, which consists of acetate of alum, ceresine and vaseline. The speakers in the discussion could not confirm the favorable results, claimed by Adam.

Harms, Clemens, Tübingen: *On peripapillary preretinal hemorrhage*, describes several cases of this rare affection.

Levinsohn, G., Berlin: *On the cortical centers of ocular movements, from experiments on monkeys*, found that the central innervation of the ocular movements extends over a large area of the cerebral cortex, viz., the posterior half of the frontal lobe, the angular gyrus and the occipital lobe. The normal position of the eyes after extirpation of all these areas and the preservation of the faculty to move the eyes, admits of the conclusion, that in the monkey the cerebral cortex is without essential influence on the normal position of the eyes and their exact movements.

Then follow 22 reports of demonstrations.

Our brief review may suffice to call attention to the importance of the subjects presented and discussed, and to urgently recommend the careful study of the interesting transactions. The external appearance of the book and the numerous colored plates are superb. C. Zimmermann.

Handbook of Human Physiology.—Nagel, W., Professor, Rostock, in conjunction with numerous collaborators. Volume I., Second Part of Second Half. 266 pp., with 45 illustrations. Braunschwig: Friedrich Vieweg und Sohn. 1909. 10 M. $2.50

Our reviews of the first part of Volume I, of Volume II, III, and IV., will be found in *Ophthalmology*, 1905, p. 841; 1907, p. 389; 1908, pp. 794 and 797.

The present number concludes Volume I and contains the elements of the doctrine of immunity by Carl Oppenheimer, and the mechanics of circulation by G. F. Nicolai.

Although the observations on immunity are chiefly derived from bacteriology, and its practical consequences, the utilization of the gained experiences, serve chiefly for diagnostic and therapeutic purposes in combatting infectious diseases. Oppenheimer propounds how the doctrine itself, i. e., the facts and laws governing the phenomena of immunity in a wider sense, is a branch of biology, extending from the normal to the pathological. He therefore intended to give here an introduction to the doctrine of immunity, as a biological adaptation.

The chapter on acquired antitoxic immunity occupies the greatest space, dealing with toxins, time of incubation, specificity, toxoids, hemolysins, antitoxins, precipitins, antienzyms; under immunity against cells: endotoxins, infection, mechanism of bactericidal immunity, cytotoxins, complements, agglutinins, and finally natural immunity.

Oppenheimer's concise and clear exposé will be heartily welcomed as a much needed guide in this new field, in which orientation has become rather difficult by the great mass of confusing detail and various views, but the familiarity with which is absolutely necessary for the understanding of modern medical literature.

The first chapter of Nicolai's elaborate essay considers circulation as a whole, viz., the symptom of distribution in the different classes of animals, and shows that only those animals have a blood circulation whose conditions of metabolism require it. Then the historical development of the knowledge of circulation is given.

The subject proper is divided in general mechanics of blood pressure, methodics of experiments on circulation: kymography, sphygmography, plethysmography, i. e., measuring the fluctuations of the volume of an organ, tachography; conditions of the blood pressure in the body, as elasticity of the walls of the vessels, volume and frequency of the heart beat, capillaries, consistency of the blood: blood pressure, the importance of measuring it, influence of position, surroundings, labor, etc., on it; pulse wave, its velocity, dicrotism, etc.; the morphological conditions of the movements of the heart, viz., the muscles of the different parts of the heart and their connections; general mechanics of the heart muscle, changes of

shape and apex beat, valves and heart sounds, accessory hearts, and energy of the heart, etc.

These and many more topics which lack of space does not permit us to mention, are very exhaustively presented, giving the best possible information.

With the forthcoming last chapters of Volume IV, which are in press, this admirable modern handbook will be completed. It deserves the highest recommendation.

C. Zimmermann.

Blindness and the Care of the Blind.—Hübner, Dr. Cassel. Ophthalmological Essays of A. Vossius, Vol. XIII., No. I. Halle a. S. Carl Marhold. 1909. 1.20 M., $0.30.

After an introduction on the causes, statistics and prevention of blindness, the author describes the historical development of the care of the blind by the state which commenced in 1260 with the foundation of the Hospice des Quinze-Vingts at Paris, by Louis the Holy of France. The first attempts of a well-planned education of the blind are of much more recent date. Haüy donated the first school of that kind in Paris, which, in 1791 was raised to a royal institute. The modern training of the blind aims to make them as much as possible independent of the help of others by appropriate instruction and preparation for suitable occupations. This, with the various kinds of print and writing for the blind, is set forth in detail. The author says, that the study of this subject was rather difficult on account of the lack of summarizing discourses and that he had to collect his material from old, and not easily accessible, sources. He accomplished the task very well and deserves grateful acknowledgment for presenting this interesting exposé of topics not generally known, but well worth knowing.

C. Zimmermann.

Encyclopedia of Ophthalmology.—Schwarz, O., with numerous collaborators. No. 17, page 753 to 800. Leipzig: F. C. W. Vogel. 1909. 2 M., $0.50.

Number 17 of this important work, the preceding installments of which we have reviewed in previous volumes of *Ophthalmology*, continues the letter S. and contains, in alphabetical order, detailed essays on diaphoretic cures by Koch, [illegible] blindness with its various subdivisions by Schwarz,

the acquirement of vision in children and people born blind by Rochlmann, visual memory by Schwarz, visual faculty by Cohn, anatomy, physiology and diseases of the optic nerve by Schwarz, Wintersteiner, Ulbrich, Elschnig, Lange, Straub, Schwarz, septicemia and pyemia by Schwartz, serum diagnostic and therapy, siderosis, simulation, etc., all very useful and practically arranged, with abundant bibliographical references.

C. Zimmermann.

Neurology of the Eye.—Wilbrand, H., and Saenger, A., Hamburg, Die Neurologie des Auges. A Handbook for neurologists and ophthalmologists. Volume IV., Part I. The pathology of the retina. 463 pp., with numerous illustrations. Wiesbaden: J. F. Bergmann. 1909. 16 M. $4.00.

In the preface to the present Volume IV. on the pathology of the retina, of this monumental work the authors show how the retina, as an advanced part of the brain deserves a detailed discussion also from the neurological standpoint. As instances are mentioned the family amaurotic idiocy which, as first pathognomonic symptom, reveals alterations of the retina, especially of the macula, the neurological importance of pigment atrophy of the retina, the value of the ophthalmoscopic detection of finest alterations of the blood vessels of the retina for the diagnosis of analogous processes in the brain, etc.

After an anatomical introduction on the different parts of the retina, circulation, efflux of lymph, the affections of the retina are considered under 2 chief headings, according to the affections of the different vascular systems, supplying them: of the outer layers from alterations of the chorio-capillaris, and of the inner layers through diseases of the central retinal artery and vein. The chapters on the diseases of the outer layers, viz., the pigment stratum and the rods and cones, to mention only a few, are on: pathological development of pigment in the retina, diseases of the pigment layers and neuroepithelium, chorioretinitis with special symptomatology: ringscotoma, hemeralopia, defects of the visual field, etc., retinitis pigmentosa, its etiology, complications, pathologic anatomy.

In the 2nd section, on diseases of the inner strata, the arrangement of the blood vessels in the retina is discussed, new formation of the blood vessels, color of blood in the vessels, lipemia, anemia, chlorosis and leukemia, visibility of the

blood current, the different kinds of pulsation, volume of the vessels, spasms, ischemia, hyperemia, cyanosis, course of the vessels, tortuosity, ectasiae, aneurysms: retinal hemorrhages in various diseases, structural changes of the walls, arteriosclerosis, embolism and thrombosis, edema and white patches of the retina, the stellate white figure at the macula, opaque nerve fibers; the single forms of retinitis, angiopathy from albuminuria, diabetes, leukemia, syphilis, sepsis, metastasis, erysipelas, retinitis punctata, circinate, etc., sequelae to sclerosis; glaucoma, conditions of the disc in vascular alterations of the inner layers, family amaurotic idiocy, etc., with many subdivisions.

The etiology, clinical aspect and pathological anatomy are exhaustively presented and illustrated by abundant casuistics and very good drawings. The literature is very conscientiously utilized, as shown by a bibliography of 1454 numbers. Nothing essential is omitted in this encyclopedic work, which will prove of the greatest practical value. A complete table of contents and index greatly facilitate orientation. Paper and print are excellent. C. Zimmermann.

A Practical Treatise on Ophthalmology.—Fox, L. Webster, M. D., L. L. D., Professor of Ophthalmology in the Medico-Chirurgical College; Ophthalmic Surgeon in the Medico-Chirurgical Hospital, Philadelphia, Pa.; Member of the Army Reserve Medical Corps, etc. Six colored plates and three hundred illustrations in text. D. Appleton & Co., New York and London. 807 pp.

In the chapter on ectropion one new operation has been added, and for entropion two have been added over the number of operations included in his previous edition.

The subject of lacrimal operations is covered with every form of practical treament, from that of the canula, dilator, and probe, to the modern method of extirpating the lacrimal sac, so much advocated in India and on the continent. Seven cuts are given, detailing each step of this operation.

Under conjunctivitis a description of micro-organism which form the etiology of each is given with its morphology, very much in detail, and forms a valuable adjunct to this chapter, but it is regretted that plates do not accompany the description, which would make the chapter more complete.

One of the new chapters added describes in detail the method of staining each of the bacilli.

In the eitiology of phlyctenular conjunctivitis no reference is made to the fact than some cases are nothing more or less than a localized tuberculosis.

A new chapter dealing with color perception, color blindness, theory of color senses, and the test for the same has been added.

The methods of cataract extraction according to Daviel, Jacobson, Steiffein, DeWecker, Lebrum, Liebreich, Von Graefe, Edouard Jaeger, Weber, Wenzell, and Snellen are given.

A very short description of Major Henry Smith's method is given, which is accurate in but very few details. A reference to the April, 1910, issue of Ophthalmology will give the details accurately by Dr. Greene in a letter from the clinic of Major Smith.

A new chapter has been added on external treatment of the eye, and the laboratory technique.

A detailed description is given for a new instrument for measuring corneal astigmatism, viz., the Sutcliffe Keratometer.

Full credence is given Stevens as being the first to formulate a practical device for the determination of retinal declinations.

A very noticable improvment is in the rearrangement of the text. The cuts are a decided improvement over those occuring in the first book on entropion, and the plates on conjunctivitis very much better than the first book. The majority of the cuts in this book are new, although the name of the book has been changed from "Diseases of the Eye" to "A Practical Treatise on Ophthalmology" it really is a second edition of his previous work, much enlarged, and with a much better arrangement of the chapters.

The reviewer heartily recommends this book for all students of ophthalmology.

A. A. MacWhinnie.

CHANGES IN STAFF.

The publishers and staff of Ophthalmology extend thanks to Dr. Wm. Zentmayer, of Philadelphia, for the able work that he has done on our department of German literature for

several years, and regret that other demands on his time have necessitated his resignation from the staff.

This position is now occupied by Dr. Edw. C. Sewall, of San Francisco.

The untimely death of our beloved friend and member of the staff of Ophthalmology, Geo. C. Harlan, of Philadelphia, has taken from us one of the heaviest workers of the staff.

The position on the department of French literature that he occupied has been filled by the appointment of Dr. F. Lewis Ziegler, of Philadelphia.

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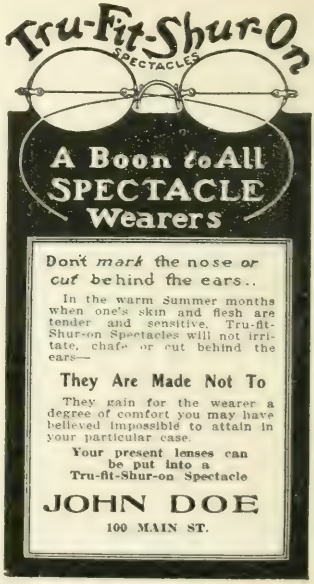
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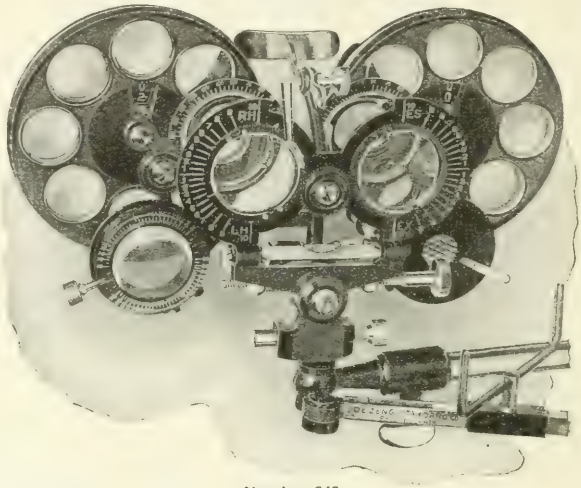

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The disks carrying the lenses are about 4¼ inches in diameter, are rotatably mounted four on either side of the instrument and are individually provided with sensitive spring stops for locating each lens as it is brought into operative position at the sight opening. The edges of the first and third disks are turned slightly outward to permit free manipulation with the closest possible alignment. This feature reduces the lens separation to the minimum and at the same time obviates the slightest possibility of faulty manipulation. Each disk, excepting the fourth, is sharply knurled on the edge and can be rotated with a very slight amount of pressure.

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The instrument is provided at the back with an adjustable fore-head rest and has a shield on either side for preventing the face of the patient from touching the disks. Each shield is provided with a clip at the sight opening for the reception of a supplementary lens if required. The instrument has the regular Revolving Gear Driven Cell for holding cylinders from the trial case, a Double Rotary Prism of 30 degrees, a Multiple Red Maddox Rod, a Stephens Phorometer with Spirit Level, a Graduated Near Point Test, and can be finely adjusted for pupillary variations. All of the lenses are spun in their cells and the Phorometer Prisms are held by metallic clamps which are an absolute safeguard against the lenses coming out, as they are apt to do when held only by cement.

For rapid and accurate work this instrument meets the requirements exactly for it contains an enormous range of standard focal equivalents, any one of which can be obtained in an instant. It is exceptionally valuable for Retinoscopy and for Muscle Testing; also for Muscle Exercise when equipped with two of our rotary prisms. It is regularly made for the 1½ inch size but can be adapted to hold 1¼ inch trial lenses when required. It is furnished complete with either Wall Bracket, Floor Stand or Chair Bracket as desired, all being new designs having sliding coarse, and rack and pinion fine adjustment.

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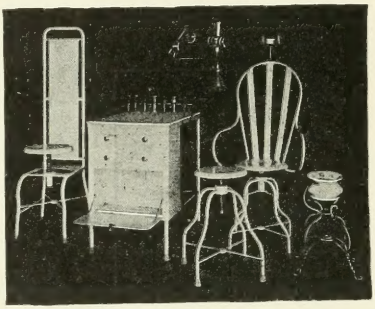

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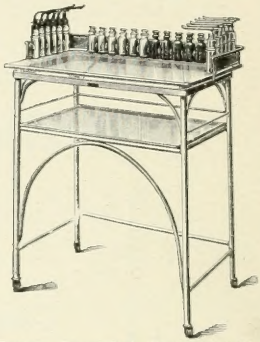

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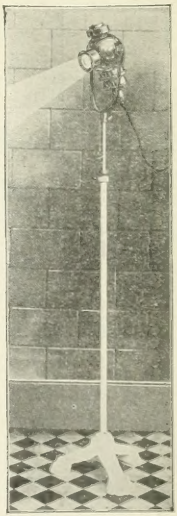

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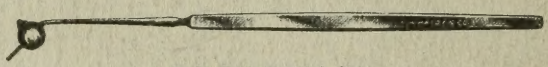

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